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Medicine

Nutritional Disorders of the Nervous System*

Part I

Maurice Victor, M.D.

Part II of this paper will be continued in the August-September issue.

Introduction

The modern concept of nutritional disease is of relatively recent development. Although the clinical features of scurvy, rickets, pellagra and beriberi had been known for many years, the idea that these illnesses resulted from a lack of essential foodstuffs only took hold at the turn of the century. Before this time it was customary to ascribe disease to the deleterious effects of certain substances in the body, i.e. "toxins." The concept that minute amounts of substances, normally present in food, could seriously influence the metabolic processes of the body was first clearly enunciated by Funk in 1911. He named them "vitamines," and his suggestion that human disease resulted from a lack of these substances provided the impetus for the wide reaching advances in nutritional science which followed. Not only have various vitamins been isolated and synthesized and their relation demonstrated to specific syndromes of disease, but the advances in the overall aspects of nutrition—in the preparation, storage, canning, and processing of food, and more recently in its distribution to undernourished peoples — represent a great stride forward in man's humanistic and social development.

Despite the central role of the vitamins in nutritional research, deficiency disease in man is not simply a matter of vitamin insufficiency. Starvation, which is a complete avitaminotic state is not attended with scurvy, beriberi or pellagra. It would appear that a certain amount of food is necessary for the development of these diseases; in fact, thiamin deficiencies are more prone to develop with diets high in carbohydrate. The development of an avitaminotic state may also be influenced by such factors as exercise, growth, pregnancy and illness, in which an increased supply of vitamins is necessary. Lesions of the intestine and liver may interfere with absorption and synthesis; also there is some evidence that the deficiency of one vitamin may be enhanced by the excess of another.

An important feature of vitamin insufficiency is the peculiar selectivity—for example, during the last war natives of Hong Kong almost all escaped "electric feet." while Europeans and Canadians on the same diet showed a high incidence of this complaint. In this regard, it was also interesting that once "electric feet" had been contracted and recovered from, a re-exposure to dietary conditions which originally elicited the complaint no longer caused the symptoms to appear. The significance of these observations is not clear. Nor can we adequately explain why similar deficiencies should cause such diverse syndromes as Wernicke's in one group of individuals and amblyopia and polyneuropathy in another.

Finally, there may be other foodstuffs than vitamins of vital importance in nutritional deficiency. The importance of amino acids, as, for example, tryptophane in pellagra is well recognized, although their exact role is not yet defined.

Diseases of nutritional origin pose a serious social and medical problem. They are an everyday occurrence in some parts of the middle and far East. Most of us are acquainted with the picture of malnutrition in prisoner of war and in the civilian populations following the last world wars. In this country, contrary to general belief, nutritional diseases are not uncommon. They may occur sporadically in impoverished and backward communities; usually they are to be found in the large alcoholic populations of urban centres. In the latter group one may encounter all of the nutritional disorders that have been described apart from alcohol. They constitute a significant portion of general and particularly mental hospital admissions.

The B Vitamins

Of the known vitamins only the B group, and more specifically thiamine, riboflavin, pantothenic acid, and pyridoxine are of importance in diseases of the nervous system. The early work on the B vitamins is closely tied to the study of beriberi and this in turn embodies the history of vitamins in general. It is therefore of interest to briefly review the main events in this story.

The modern studies which resulted in the analysis of the B complex probably began in 1882, when Admiral Takaki, the Medical Director of the Japanese Navy, practically eliminated beriberi among naval ratings by the addition of fish, meat, vegetables and barley to the rice diet. In 1897, Eijkman, a medical officer of the Dutch East Indies, published an account of his fundamental experiments; he showed that the paralytic state of pigeons which resulted from a diet of polished rice could be cured by a substance in rice polishings. His successor, Grijns, postulated that the

*From the Neurology Service, The Massachusetts General Hospital, Boston, Mass. This article is an enlarged version of a lecture to the section on Internal Medicine of the Manitoba Medical Association, October, 1956.

substance in rice polishings was also capable of curing the neuritis of beriberi. The classic controlled experiments of Fletcher and Fraser and Stanton confirmed Grijns' contention; they showed, in prisoners, that a diet of polished rice produced beriberi whereas unpolished rice failed to do so; switching the diets reversed the results. In 1911 Funk obtained an extract from rice polishings which was rich in anti-beriberi substances, although not the pure vitamin.

Originally there was confusion between the anti-beriberi and the anti-rachitic factors, but they were separated on the basis of their relative solubilities in water and fats. The fat soluble factor was labelled vitamin A; the water soluble factor, vitamin B.

The experimental work done between 1920 and 1926, disclosed that vitamin B comprised more than one substance. The great step forward came with the resolution of vitamin B into two groups—a heat stable factor (anti-pellagra) and a heat labile factor (anti-neuritic-vitamin). The heat stable factor was named vitamin B_1 and its ultimate synthesis was accomplished by Williams in 1936. He renamed this vitamin thiamin, on account of its unique chemical property — the possession of a thiazole group; in England it has been called aneurin (anti-neuritic-vitamin). The heat stable factor was named vitamin B_2, and the next decade was occupied with the separation of its component parts. The work progressed simultaneously along several lines — biochemical, animal experimental and human experimental. At times, based on the application of incomplete knowledge from one or other of these sources, erroneous conclusions were drawn, which seriously confused the problem. Gradually the picture of the B vitamins was clarified. The steps by which this was accomplished will be summarized, but only in the briefest manner and without regard for the exact order in which they occurred.

Yeast and liver have been the usual sources of the B vitamins. The heat labile portion (vitamin B_1) was removed by autoclaving the yeast. A solution was then made of the autoclaved portion, and this was treated with charcoal or fuller's earth. The adsorbed (and subsequently eluted) portion contained riboflavin, pyridoxine and nicotinamide. In the filtrate portion, pantothenic acid, among other factors, was detected.

The role of nicotinamide was determined by a number of means, largely through the efforts of Elvejhem and his colleagues. In 1937 they demonstrated that this vitamin had growth promoting properties in young animals, that it cured black-tongue in dogs (a deficiency disease with some of the mucocutaneous characteristics of pellagra), and finally that it was effective in human pellagra.

The distinctive properties of riboflavin, pyridoxine and pantothenic acid were delineated by a long series of animal experiments, particularly those of Gyorgy, Chick, Goldberger and their co-workers. That the B_2 group of vitamins consisted of more than one substance became evident from the early experiments in rats. When these animals were deprived of heat stable vitamins two types of dermatitis could be distinguished:

a) A florid dermatitis, roughly symmetrical, with swelling and redness of the digits, paws and ears, "spreading over the limbs and trunk with cracking and desquamation of the skin." "This was the so-called "rat-pellagra" of Goldberger & Lillie, the "rat-acrodynia" of Gyorgy et al, and the "dermatitis" of Chick. This type of lesion in rats developed with diets that contained riboflavin, and was cured by a factor in the eluate from charcoal. This was variously called "supplementary factor," Peters' eluate, and finally, as Gyorgy had suggested, vitamin B_6 or pyridoxine.

b) The second form of dermatitis affected the head and chest with a loss of fur, and without swelling or inflammation of the skin, but with serous exudation from the eyelids and nostrils. This type of dermatitis could be cured by adding another of the adsorbed factors—riboflavin.

In addition to riboflavin and pyridoxine, Chick and her co-workers in 1935 isolated another factor of importance in the growth of rats. After adsorption of an autoclaved yeast extract with fuller's earth, there remained in the filtrate a heat stable substance which stimulated the growth of rats receiving both vitamin B_1 and riboflavin. This substance, in distinction to vitamin B_6 had no curative effect on the florid dermatitis; this later proved to be pantothenic acid.

With the identification of the various B vitamins, a large number of experiments were undertaken to elucidate their specific role in the nutrition of the nervous system. Most of this work has been done in animals, but a considerable body of data also accrued from experiments on man. Conclusions drawn from the experimental work have been indiscriminately applied to human disease and this has resulted in considerable confusion. For the sake of clarity, therefore, the nutritional diseases of the nervous system will be considered from three points of view: a) The animal experimental, b) the human experimental, and c) the naturally occurring diseases in man.

Experimental Nutritional Deficiency in Animals

Much of the animal experimental work is open to serious criticism. Practically all the studies done before the B vitamins became available in crystalline form are unacceptable. In many of the early experiments on thiamine deficiency the assumption was made that by autoclaving yeast only the thiamine was destroyed, and that when animals were fed a diet supplemented with such yeast all the factors of the B complex were furnished in adequate amounts except thiamine. It has since been recognized that other factors, notably pantothenic acid, are destroyed by this process. Only with the use of the crystalline vitamins has it been possible to observe the effects produced

by the omission of each member of the B group without the risk of confusion which is inevitable when crude extracts or autoclaved diets are used.

The experimental work is open to criticism on other grounds as well. Since a B vitamin deficiency induces a failure of appetite one must be certain that the pathological changes attributed to the vitamin deficiency are not really due to the accompanying state of general inanition. Many workers have failed to consider this factor and to study control animals which had been starved, although supplied with vitamins.

In many reports the pathological descriptions and illustrations are unsatisfactory, particularly where the tissues had been stained by the Marchi method. Blackening of myelin sheaths by the Marchi method is not, per se, pathognomonic of degeneration; one must observe the actual pattern of degenerating myelin and axis cylinders before such a conclusion can be reached. Confusion may also arise from the fact that starvation produces changes in the myelin that cause it to stain by the Marchi method. Also, actual lesions may be missed if the animals are sacrificed before the products of myelin degeneration become stainable by the conventional Marchi method (about four days are usually required).

Virtually no experiment will meet all the demands for purity made by the nutritionist. Nevertheless, there is a body of experimental data in animals which clearly indicates that the B vitamins are essential in maintaining the integrity of the nervous system. This data is summarized below in its briefest form:

Thiamine deficiency in the rat, dog, pigeon and chick may cause a degeneration of peripheral nerves, and where the dorsal roots or their ganglia are involved, of the posterior columns of the spinal cord. Lesions of the central nervous system, in the region of the vestibular nuclei, have been produced in the rat and in the pigeon. The pigeon experiments of Swank are particularly convincing, insofar as they are the only ones in which a regeneration of nerve was brought about when thiamine alone was added to the diet which had produced the neuropathy.

In foxes, mink, and recently in cats, a central nervous system lesion has been produced by the use of a fish diet containing a thiamine-destroying enzyme, thiaminase. The lesion thus produced is a predominantly hemorrhagic one, consistently affecting the inferior colliculi, to a lesser extent the vestibular and oculomotor nuclei and only irregularly the mammillary bodies. These lesions, as well as those produced in thiamine-deficient pigeons, have been frequently represented as analogous to the lesions in Wernicke's disease. Actually there is only a superficial resemblance, both in regard to the nature and the location of the lesion; the lesions produced in monkeys by the thiamine-deficient diet of Rinehart and Greenberg are far more convincing. This point will be elaborated in discussing the pathology of Wernicke's disease.

Pyridoxine deficiency has been found in rats, chicks, pigs, dogs, turkeys, calves, and dogs to be regularly attended by convulsions; the pigs and dogs, in addition, suffer an ataxia of gait or weakness of the limbs. The pathological basis for these abnormalities in the central and peripheral nervous system has been the subject of very few studies. In swine, degenerative changes have been observed in the peripheral nerves, dorsal root ganglia, the posterior roots and the posterior columns of the spinal cord. The evidence for a similar lesion in dogs is far less satisfactory. These findings would explain the weakness and ataxia, but in the brains of these animals, as well as those of rats, no abnormalities have been found.

Recently, in pyridoxine deficient monkeys, we have observed abnormalities of the large nerve cells of the cerebral cortex, which showed swelling, eccentricity of the nuclei and loss of the Nissl particles. This cell change bears a strong resemblance to that seen in human pellagra. More observations are necessary to decide the specificity of this cell change in pyridoxine deficiency.

Pantothenic acid deficiency, like that of pyridoxine, causes a degenerative change in the peripheral sensory neurone of swine. It would appear that pantothenic acid is also essential for the integrity of the peripheral nerves in the mouse, and of the spinal cord in chicks.

Riboflavin deficiency has been shown to cause degenerative lesions in the peripheral nerves of the rat and chick, and possibly of the mouse. In monkeys, swine and dogs who had subsisted for prolonged periods on a riboflavin deficient diet, incoordination of the limbs and disorders of gait have been observed. However, in the experiments on monkeys only clinical data is available; in the swine and dogs the pathologic studies are fragmentary and inconclusive.

One must be cautious in drawing close analogies between the animal studies and the nutritional diseases of man. In animals, vitamin deficiencies have been created under highly artificial conditions and, for the most part, in the developing nervous system. The vitamin requirements vary greatly from one species to another, so that one hesitates to apply the findings in any one species to man. Granting that deficiencies of single vitamins have been accomplished, the human counterparts are difficult to find. Rarely can the disease in man be related to a deficiency of a single vitamin. With these reservations in mind, those aspects of the animal work which have an application to human disease will be indicated at appropriate points in the ensuing discussion.

Experimental Vitamin Deficiency in Humans

This aspect of the subject is of limited scope, because of its purely clinical nature and also

because of the restrictions in the experimental methods which can be employed in humans. Although these experiments are small in number, the information derived from them is manifestly more important than that obtained from animals. It will be briefly summarized.

One method which has been successfully employed in assessing the role of thiamine deficiency has followed that employed in animals, viz., the use of a basal diet with the addition of all the crystalline vitamins except thiamine. Mental symptoms such as irritability, depression, defective memory and failure of concentration and peripheral symptoms such as parasthesias and tenderness of the calves have been readily produced by this procedure. Frequently these symptoms have been so distressing that the experiments have had to be abandoned. The production of neurologic signs has been far more difficult, as exemplified by the work of Williams and his associates. These authors, after numerous unsuccessful trials, induced definite signs of polyneuropathy in the lower limbs of two individuals, in whom the thiamine intake was restricted to 0.2 mg. daily for 110 days. In one of these cases the signs were largely reversed after 60 days of treatment with thiamine. In the other patient the knee and ankle jerks were still absent after 121 days of treatment, probably indicating that a severe morphologic lesion had been produced.

Using a similar procedure, Horwitt and his colleagues and Najjar and Holt have reproduced these findings in larger numbers of patients. The latter authors produced a neuropathy in four of nine patients, and made the interesting observation that each of the subjects who remained free of nutritional symptoms showed large quantities of free thiamine in the feces. These authors presented evidence that in man thiamine can be synthesized and absorbed from the large intestine, a fact which may explain discrepancies in human thiamine requirement found by different observers.

Because of the long time required by such experimental procedures, we have employed another method to determine the role of thiamine, as well as of other vitamins, in nutritional disease. In patients with the Wernicke-Korsakoff syndrome, the presenting neurologic signs were carefully evaluated; the patients were then observed for several days while receiving a diet deficient in the B vitamins; various vitamins were then added, and the effect on the neurologic signs was assessed. The addition of thiamine alone proved to have a dramatic effect in reversing the opthalmoplegia as well as the drowsiness and apathy; the ataxia and nystagmus improved more slowly and incompletely. The effect of thiamine on the amnestic symptoms was more difficult to assess, and will be considered in detail in the discussion of the Korsakoff syndrome.

That pyridoxine is important in human nutrition was first suggested by a clinical accident. In 1951, a large number of infants receiving a commercial milk product, which was proved to be deficient in pyridoxine, developed convulsive seizures. The role of pyridoxine deficiency in producing convulsions in infancy was further demonstrated by Hunt and by Snyderman and her associates. The former author described an infant in whom convulsions were entirely controlled by pyridoxine, only to recur when the pyridoxine was withdrawn. The latter authors produced convulsions in a feeble-minded infant by an experimental diet deficiency in pyridoxine. Also, it was discovered that the neuropathy which occurred in tuberculous patients receiving isonicotinic acid hydrazide (INH) was due to an interference or metabolic antagonism of pyridoxine. The existence of a polyneuropathy due to pyridoxine deficiency was corroborated by the clinical investigation of Vilter and his colleagues; they induced the symptoms and signs of peripheral nerve disease (as well as the characteristic skin changes of pellagra) in human volunteers, by the administration of a pyridoxine antagonist, desoxypyridoxine.

By using a diet low in pantothenic acid supplemented with a pantothenic acid antagonist, omega-methylpantothenic acid, Bean and his associates were able to produce a characteristic syndrome in human volunteers. This consisted of weakness, fatigue and a decrease in spontaneous activity, and later by torpor and drowsiness. Dizziness and unsteadiness were severe. In some subjects there were neuromuscular abnormalities, consisting of paresthesias, weakness of the muscles of the hands and feet, muscle tenderness and an increase in tendon reflexes. These symptoms and signs improved when the antagonist was replaced by pantothenic acid.

Nutritional Diseases of the Nervous System

No classification of these diseases is entirely satisfactory. Our knowledge of the pathology is not complete enough to allow for clear distinctions on this basis. A tempting classification is an etiologic one, in which recognized clinical syndromes are related to single vitamin deficiencies. Excepting for subacute combined degeneration of the cord (vitamin B_{12}) and certain aspects of Wernicke's disease (vitamin B_1) this is not possible. It would appear from the experimental data that polyneuropathy may result from one of several vitamin deficiencies. Other syndromes, such as beriberi, which have been repeatedly ascribed to a deficiency of thiamine, may be due to a deficiency of several factors; this would be suspected where the diet consists mainly of milled rice. The etiology of pellagra is even more complex—not only may several of the B vitamins be involved, but also the amino acid tryptophane, and in some cases a "pellagrogenic" agent in the diet. For these reasons, a clinical classification is suggested, comprising the following syndromes:

1. Wernicke's disease and Korsakoff's psychosis.
2. Nutritional polyneuropathy (neuritic beriberi).

3. Nutritional amblyopia (retrobulbar neuropathy).
4. Pellagra.
5. Strachan's syndrome.
6. Subacute combined degeneration of the cord.

With the exception of subacute combined degeneration of the cord, these symptoms are rarely seen in pure form; instead there is considerable overlapping from one to another. In patients with nutritional disease, it is usual for more than one part of the nervous system to be involved; this is a point of considerable diagnostic importance, for involvement of both the central and peripheral nervous system is found in only a few clinical circumstances. Also, the examination of these patients frequently discloses signs of malnutrition aside from those associated with the major neurologic syndrome. These include general wasting, various mucocutaneous lesions, circulatory abnormalities and signs of scurvy.

The relationship of alcoholism to nutritional disease: In this country the nutritional disorders of the nervous system are particularly prominent in the alcoholic population of the large urban centres. Alcohol plays only a secondary role, however, by displacing food in the diet. This is evident from the fact that all of the nutritional syndromes encountered in alcoholics have been described under circumstances apart from alcoholism.

The clinical descriptions to follow are based on observations in mal-nourished alcoholics. In some instances the nutritional syndrome in alcoholics have their exact counterpart in non-alcoholics; in others, there are discrepancies, but these are not fundamental. Discrepancies of the same order arise when one compares the nutritional syndromes reported from various tropical communities. The differences are mainly in the disproportionate involvement of one part of the nervous system compared to another. At appropriate points in the discussion these differences will be pointed out.

Wernicke's Disease

In 1881 Carl Wernicke described an illness of sudden onset, characterized by mental disturbance, paralysis of eye movements and ataxic gait. His observations were made on three patients in all, two of whom were alcoholics, and one a young woman with persistent vomiting following the ingestion of sulphuric acid. Swelling of the optic discs with retinal hemorrhages were also said to be present, and in all three patients there was a progressive depression of the state of consciousness and death. A fatal outcome has thus come to be regarded as a universal feature of this disease.

Pathologically he described f o c a l vascular lesions, primarily affecting the gray matter around the third and fourth ventricles and aqueduct of Sylvius. He regarded the disease as inflammatory in nature, and suggested the name acute superior hemorrhagic polioencephalitis. The term superior was intended to separate this disease from a hemorrhagic disorder of the lower brain stem which had been described previously.

Since Wernicke's time our views regarding this disease have been considerably modified, clinically, pathologically and etiologically.

The crux of the clinical picture is the ocular disturbance, and the diagnosis of Wernicke's disease, at least during life, cannot be made without it. The usual ocular motor signs consist of (1) nystagmus that is both horizontal and vertical, (2) paralysis of the external recti, and (3) paralysis of conjugate gaze.

These signs show a considerable diversity. The paralysis of conjugate movements varies from merely a nystagmus on extreme gaze in one direction to a complete loss of ocular movement in that direction. This applies to both horizontal and vertical movements, though abnormalities of the former are commoner. Paralysis of downward gaze is an unusual manifestation of Wernicke's or of any neuro-ophthalmic disease. Next to nystagmus, one most frequently encounters a lateral rectus muscle weakness or paralysis. The sixth nerve palsy is always bilateral, though not always symmetrical, and is accompanied by diplopia and internal strabismus. With lateral rectus paralysis there may be an initial absence of nystagmus in the abducting eye, the nystagmus becoming evident as the weakness improves. In advanced stages of the disease there may be a complete loss of ocular movement, and the pupils which ordinarily are spared may become miotic and non-reacting. Other ocular disturbances, such as ptosis, retrobulbar neuropathy, retinal hemorrhages, involvement of the near-far focusing mechanism and internuclear ophthalmoplegia are decidedly rare, although they do occur on occasion. We have never observed papilledema in this disease.

In the early stages of the disease, only the ocular signs may be present. By the time the patient is seen by the physician, two additional groups of symptoms are practically always present —ataxia and mental disturbance.

The ataxia is mainly one of stance and gait. In its severest form the patient is literally unable to stand or walk without support. He assumes a position with feet wide apart, trunk inclined forward and his attitude is one of fearfulness and uncertainty; even with support, he makes his way forward with short uncertain steps and unpredictable lurching and lapses in posture. Less severe forms of this disorder are characterized by a slow, wide-based, short-stepped gait. The mildest degree of ataxia may be brought out only by special tests, such as heel-to-toe walking. In contrast to the gross disorder of locomotion is the relative infrequency of a clear-cut intention tremor. When present, it is more likely to be encountered on heel-to-shin than on finger-to-nose testing. Scanning speech is present only in isolated instances.

The ataxia of gait is most likely cerebellar in origin, but it is often mistakenly attributed to a polyneuropathy. Affection of the peripheral nerves

is common in Wernicke's disease, occurring, in our experience, in over half the patients; in the majority of these patients, however, the signs of neuropathy are so slight that they could not account for the disordered gait. In a small proportion the neuropathy is so severe that stance and gait cannot be tested.

The third consistent clinical feature of Wernicke's disease is the mental disturbance. Several distinct groups of mental symptoms can be recognized.

1) A small group of patients shows the characteristic mental symptoms of delirium tremens or its variants, i.e. hallucinations and other disorders of sense perception, confusion, agitation and autonomic overactivity. The severity of these symptoms varies with the severity of the alcoholism and the stage at which the patient is seen relative to the cessation of drinking. The symptoms are evanescent in nature and may clear without any treatment. It is not surprising that the symptoms of delirium should occur in patients with a background of alcoholism; it is of interest that a psychosis of this sort has been described as the initial episode in Wernicke's disease in prisoner-of-war camps.

2) A second and much larger group is of an entirely different nature. When first seen, the outstanding feature of the abnormal mental state is the patient's apathy and listlessness. Unconsciousness as part of the initial episode is distinctly rare. Even drowsiness is not common, the patient's attitude being better described as one of disinterest or indifference. Spontaneous speech is minimal. The patient is inattentive and he cannot concentrate on the simplest task. Thus many questions may go unanswered, or the patient may suspend the conversation in the middle of a sentence, to turn over and sleep. He is readily roused from this state, however. What questions the patient answers betray disorientation in time and place, misidentification of those around him, and an inability to grasp the meaning of his illness or immediate situation. Many of his remarks are irrational, nor do these show any consistency from one moment to another. Under these circumstances a proper evaluation of the mental status is seldom possible. Where his interest and attention can be maintained for a long enough period to insure adequate testing, one usually finds that an impairment of retentive memory and other cognitive functions partake of the general mental disorganization.

If these patients are given thiamine or simply an adequate diet, they lose most of these symptoms in a matter of days. They become more alert, attentive and responsive, and in general more able to partake in mental testing. Then the most prominent abnormality is one of retentive memory, or what is ordinarily regarded as Korsakoff's psychosis.

3) In the third group the patients are alert and responsive from the time they are first seen and already have the characteristic disorder of retentive memory and of other cognitive functions that are recognized as Korsakoff's psychosis. The features of this disease will be considered later.

A number of other clinical aspects of this disease are worth noting. As Wernicke pointed out, the symptoms have an abrupt, almost apoplectic onset. The symptoms may come on together; more frequently the ophthalmoplegia and ataxia precede the mental signs by a few days or a week. Unlike the outcome in Wernicke's patients and contrary to widespread present-day belief, a lethal termination is not invariable. Only 16 per cent of our patients died, and most of these were complicated by other serious illnesses, such as cirrhosis of the liver or tuberculosis. These patients may also show other stigmata of malnutrition, the most frequent of which is polyneuropathy; occasionally there may be a complicating amblyopia or spinal spastic ataxia.

Although neuropathy is commonplace in Wernicke's disease, the advanced signs of beriberi heart disease are very rare. However, there are indications of disordered cardiovascular function in these patients. Tachycardia, exertional dyspnea, postural hypotension, and minor electrocardiographic abnormalities are frequent findings, Occasionally such a patient may die suddenly—the mode of death suggesting "cardiovascular collapse." It has been shown that Wernicke's disease is characterized by a state of high cardiac output, out of proportion to the oxygen consumption. Our own observations suggest that this is due to an abnormal state of vasodilatation, which in turn may be related specifically to thiamine deficiency.

Pathologically, too, our ideas have altered considerably since Wernicke's time. The disease process is limited neither to grey matter nor to the upper brain stem; hemorrhagic lesions are not present in all instances, and when they are present do not necessarily represent the most significant or prominent change. Postmortem examination reveals symmetrically located lesions in the paraventricular regions of the thalamus and hypothalamus, the mammillary bodies, the periaqueductal region of the midbrain, and floor of the fourth ventricle, particularly in the region of the dorsal motor nucleus of the vagus. The lesions are consistently found in the mammillary bodies, less consistently in the other areas.

Microscopically the lesions are characterized by varying degrees of necrosis of parenchymal structures. There is a vacuolization of the tissue and a looseness of structure; some nerve cells are lost, but some are left, and though some of these are damaged, some are intact. Also some fibres remain, as well as some normal glial background tissue. These changes result in a prominence of

3. Nutritional amblyopia (retrobulbar neuropathy).
4. Pellagra.
5. Strachan's syndrome.
6. Subacute combined degeneration of the cord.

With the exception of subacute combined degeneration of the cord, these symptoms are rarely seen in pure form; instead there is considerable overlapping from one to another. In patients with nutritional disease, it is usual for more than one part of the nervous system to be involved; this is a point of considerable diagnostic importance, for involvement of both the central and peripheral nervous system is found in only a few clinical circumstances. Also, the examination of these patients frequently discloses signs of malnutrition aside from those associated with the major neurologic syndrome. These include general wasting, various mucocutaneous lesions, circulatory abnormalities and signs of scurvy.

The relationship of alcoholism to nutritional disease: In this country the nutritional disorders of the nervous system are particularly prominent in the alcoholic population of the large urban centres. Alcohol plays only a secondary role, however, by displacing food in the diet. This is evident from the fact that all of the nutritional syndromes encountered in alcoholics have been described under circumstances apart from alcoholism.

The clinical descriptions to follow are based on observations in mal-nourished alcoholics. In some instances the nutritional syndrome in alcoholics have their exact counterpart in non-alcoholics; in others, there are discrepancies, but these are not fundamental. Discrepancies of the same order arise when one compares the nutritional syndromes reported from various tropical communities. The differences are mainly in the disproportionate involvement of one part of the nervous system compared to another. At appropriate points in the discussion these differences will be pointed out.

Wernicke's Disease

In 1881 Carl Wernicke described an illness of sudden onset, characterized by mental disturbance, paralysis of eye movements and ataxic gait. His observations were made on three patients in all, two of whom were alcoholics, and one a young woman with persistent vomiting following the ingestion of sulphuric acid. Swelling of the optic discs with retinal hemorrhages were also said to be present, and in all three patients there was a progressive depression of the state of consciousness and death. A fatal outcome has thus come to be regarded as a universal feature of this disease.

Pathologically he described *focal* vascular lesions, primarily affecting the gray matter around the third and fourth ventricles and aqueduct of Sylvius. He regarded the disease as inflammatory in nature, and suggested the name acute superior hemorrhagic polioencephalitis. The term superior was intended to separate this disease from a hemorrhagic disorder of the lower brain stem which had been described previously.

Since Wernicke's time our views regarding this disease have been considerably modified, clinically, pathologically and etiologically.

The crux of the clinical picture is the ocular disturbance, and the diagnosis of Wernicke's disease, at least during life, cannot be made without it. The usual ocular motor signs consist of (1) nystagmus that is both horizontal and vertical, (2) paralysis of the external recti, and (3) paralysis of conjugate gaze.

These signs show a considerable diversity. The paralysis of conjugate movements varies from merely a nystagmus on extreme gaze in one direction to a complete loss of ocular movement in that direction. This applies to both horizontal and vertical movements, though abnormalities of the former are commoner. Paralysis of downward gaze is an unusual manifestation of Wernicke's or of any neuro-ophthalmic disease. Next to nystagmus, one most frequently encounters a lateral rectus muscle weakness or paralysis. The sixth nerve palsy is always bilateral, though not always symmetrical, and is accompanied by diplopia and internal strabismus. With lateral rectus paralysis there may be an initial absence of nystagmus in the abducting eye, the nystagmus becoming evident as the weakness improves. In advanced stages of the disease there may be a complete loss of ocular movement, and the pupils which ordinarily are spared may become miotic and non-reacting. Other ocular disturbances, such as ptosis, retrobulbar neuropathy, retinal hemorrhages, involvement of the near-far focusing mechanism and internuclear ophthalmoplegia are decidedly rare, although they do occur on occasion. We have never observed papilledema in this disease.

In the early stages of the disease, only the ocular signs may be present. By the time the patient is seen by the physician, two additional groups of symptoms are practically always present —ataxia and mental disturbance.

The ataxia is mainly one of stance and gait. In its severest form the patient is literally unable to stand or walk without support. He assumes a position with feet wide apart, trunk inclined forward and his attitude is one of fearfulness and uncertainty; even with support, he makes his way forward with short uncertain steps and unpredictable lurching and lapses in posture. Less severe forms of this disorder are characterized by a slow, wide-based, short-stepped gait. The mildest degree of ataxia may be brought out only by special tests, such as heel-to-toe walking. In contrast to the gross disorder of locomotion is the relative infrequency of a clear-cut intention tremor. When present, it is more likely to be encountered on heel-to-shin than on finger-to-nose testing. Scanning speech is present only in isolated instances.

The ataxia of gait is most likely cerebellar in origin, but it is often mistakenly attributed to a polyneuropathy. Affection of the peripheral nerves

is common in Wernicke's disease, occurring, in our experience, in over half the patients; in the majority of these patients, however, the signs of neuropathy are so slight that they could not account for the disordered gait. In a small proportion the neuropathy is so severe that stance and gait cannot be tested.

The third consistent clinical feature of Wernicke's disease is the mental disturbance. Several distinct groups of mental symptoms can be recognized.

1) A small group of patients shows the characteristic mental symptoms of delirium tremens or its variants, i.e. hallucinations and other disorders of sense perception, confusion, agitation and autonomic overactivity. The severity of these symptoms varies with the severity of the alcoholism and the stage at which the patient is seen relative to the cessation of drinking. The symptoms are evanescent in nature and may clear without any treatment. It is not surprising that the symptoms of delirium should occur in patients with a background of alcoholism; it is of interest that a psychosis of this sort has been described as the initial episode in Wernicke's disease in prisoner-of-war camps.

2) A second and much larger group is of an entirely different nature. When first seen, the outstanding feature of the abnormal mental state is the patient's apathy and listlessness. Unconsciousness as part of the initial episode is distinctly rare. Even drowsiness is not common, the patient's attitude being better described as one of disinterest or indifference. Spontaneous speech is minimal. The patient is inattentive and he cannot concentrate on the simplest task. Thus many questions may go unanswered, or the patient may suspend the conversation in the middle of a sentence, to turn over and sleep. He is readily roused from this state, however. What questions the patient answers betray disorientation in time and place, misidentification of those around him, and an inability to grasp the meaning of his illness or immediate situation. Many of his remarks are irrational, nor do these show any consistency from one moment to another. Under these circumstances a proper evaluation of the mental status is seldom possible. Where his interest and attention can be maintained for a long enough period to insure adequate testing, one usually finds that an impairment of retentive memory and other cognitive functions partake of the general mental disorganization.

If these patients are given thiamine or simply an adequate diet, they lose most of these symptoms in a matter of days. They become more alert, attentive and responsive, and in general more able to partake in mental testing. Then the most prominent abnormality is one of retentive memory, or what is ordinarily regarded as Korsakoff's psychosis.

3) In the third group the patients are alert and responsive from the time they are first seen and already have the characteristic disorder of retentive memory and of other cognitive functions that are recognized as Korsakoff's psychosis. The features of this disease will be considered later.

A number of other clinical aspects of this disease are worth noting. As Wernicke pointed out, the symptoms have an abrupt, almost apoplectic onset. The symptoms may come on together; more frequently the ophthalmoplegia and ataxia precede the mental signs by a few days or a week. Unlike the outcome in Wernicke's patients and contrary to widespread present-day belief, a lethal termination is not invariable. Only 16 per cent of our patients died, and most of these were complicated by other serious illnesses, such as cirrhosis of the liver or tuberculosis. These patients may also show other stigmata of malnutrition, the most frequent of which is polyneuropathy; occasionally there may be a complicating amblyopia or spinal spastic ataxia.

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the blood vessels, although in some cases there is actual endothelial proliferation. Hemorrhages are not found in every case; they are discrete and usually give the appearance of being agonal in nature. In the areas of parenchymal change there is a density of cells, representing astrocytic and microglial proliferation. These changes are most intense in the centre of the lesion, shading off towards the periphery, where there is some looseness of structure and microglial cell proliferation, and where some of the nerve cells appear shrunken and eosinophilic. The oculomotor nuclei are either spared entirely, or are only involved to a mild degree. The lack of significant structural changes in these nuclei is consistent with the rapid clinical improvement in oculomotor function. Several of our cases have also shown cerebellar lesions consisting mainly of a loss of Purkinje cells, the vermis being more affected than other parts, and the superior vermis more affected than the inferior. The cerebellar lesions require further study.

Finally, the Wernicke syndrome is no longer regarded as inflammatory in nature or the result of the neurotoxic effects of alcohol; nutritional deficiency is now established as the causal factor. Outbreaks have been encountered in prisoner-of-war camps, and occasional cases have been reported in wasting diseases of varied origin, where alcohol played no part.

The specific nutritional factor in most, if not all, the symptomatology of Wernicke's disease is thiamine. The experimental evidence for this statement, both in animals and in man, has been mentioned. This idea has received confirmation through numerous clinical observations including our own. We have noted the effects of thiamine and other vitamins on the various components of the Wernicke syndrome, the patients being kept throughout the experimental period on a synthetic diet composed only of glucose, minerals and water. Prior to the administration of thiamine there was no improvement in any of the signs. More specifically, despite alcohol withdrawal, bed rest and the addition of other vitamins (exclusive of thiamine) the ophthalmoplegia progressed, while the nystagmus decreased only in association with an increase in ocular paralysis. When thiamine alone was added to the purified diet, the ophthalmoplegia began to improve within a few hours, and cleared completely within a few days to a week. Diminution in nystagmus and ataxia also occurred, but the change was more gradual and usually these symptoms persisted in mild form for months or years after their onset. In view of these observations there seems to be little doubt that the ophthalmoplegia, nystagmus and ataxia are related to thiamine deficiency. Several of our patients made a usual recovery with a diet consisting of a pint of whisky daily in addition to thiamine. The marked sensitivity of the ophthalmoplegia to the administration of thiamine accounts for the rapid disappearance of this sign following a meal or two. The quality of prompt reversibility suggests that the symptoms are due to a biochemical abnormality and not to structural change.

The relation of thiamine administration to the clearing of mental symptoms is a more difficult problem to assess. In the experimental studies mentioned above, symptoms such as apathy, drowsiness, listlessness, inattentiveness, and inability to concentrate and to sustain a conversation cleared rapidly with thiamine; it is very likely therefore that this aspect of the mental disorder is related to thiamine deficiency. With respect to memory defect and confabulation (i.e. the Korsakoff syndrome), no significant improvement could be discerned within the periods of glucose and thiamine administration, which measured 11 days in the longest instance. Drawing an analogy to the slow rate of recovery of peripheral neuropathy, however, it was felt that this period may have been too short to evaluate the effect of thiamine. Accordingly, we made observations on 12 patients who were maintained on a vitamin B deficient diet for as long as 8 weeks, thiamine being the only nutritional supplement. In four of these patients the memory defect remained unchanged; in two there was a complete recovery; in six others there was a partial recovery. This outcome was very much the same as occurred in a control group of patients under the best nutritional circumstances, i.e. on a full diet with all the vitamin supplements from the outset of the illness. These data suggest that the lesions responsible for the memory loss are structural rather than biochemical in nature, and once fully developed are reversed slowly and often incompletely. The failure of the Korsakoff component to respond to thiamine may be governed by the inherent slowness of recovery of damaged brain tissue and to the amount of damage; it need not be due to a combination of several nutritional deficiencies, as has been suggested by some authors. Finally, these data do not exclude the possibility that thiamine deficiency is responsible for the amnestic, as well as the other symptoms of the Wernicke-Korsakoff syndrome.

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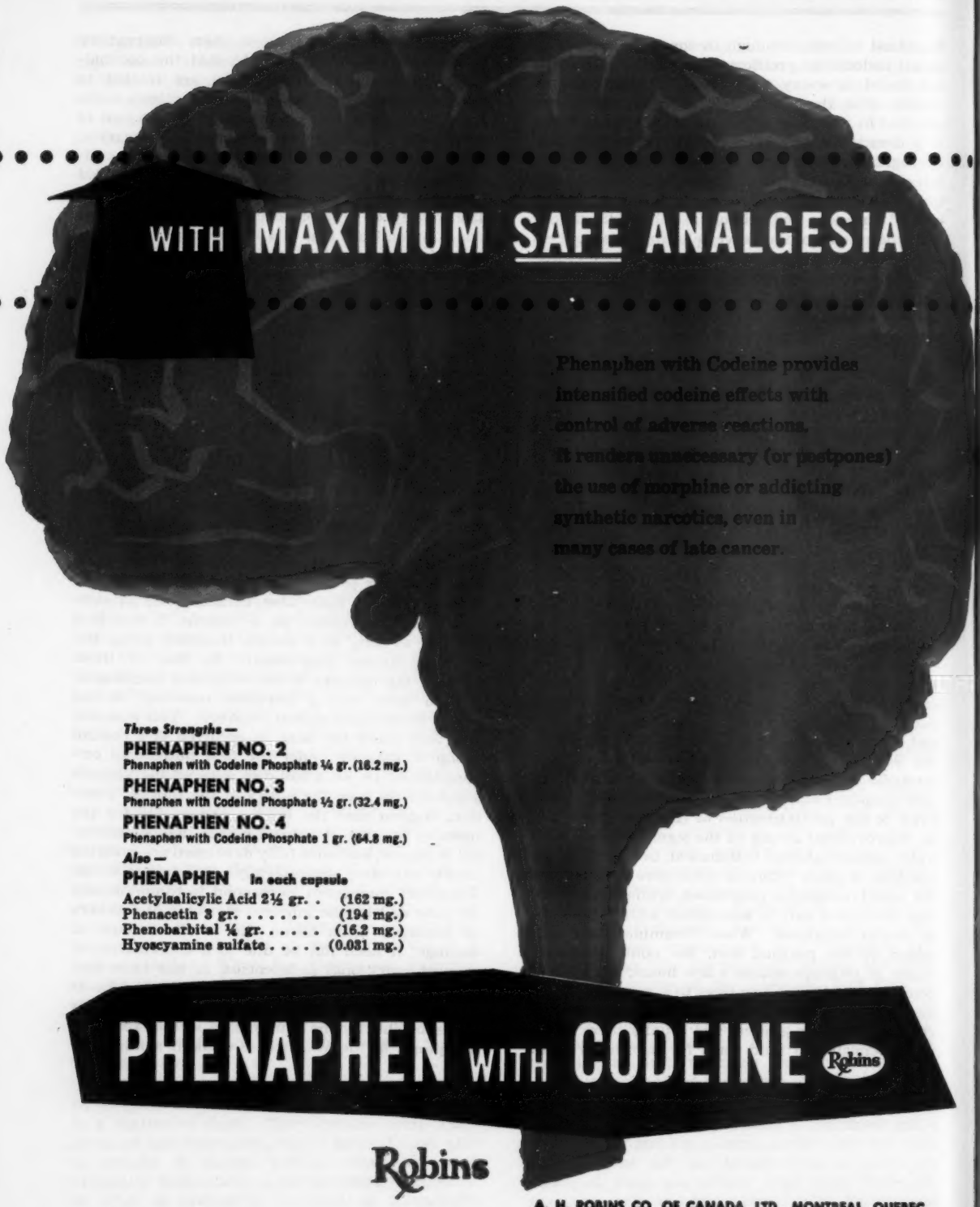

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The Classification of Epilepsy

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A diagnosis is essentially a short description of an individual's disease—separating that individual from the herd into smaller herds of varying size. In most instances, the primary term may be further modified by additional terms, further narrowing the group into which the person falls. For example, the primary diagnostic group of Rheumatic Heart disease is successively sub-grouped according to the presence or absence of: (1) Mitral Stenosis, (2) Right Ventricular Hypertrophy, (3) Auricular Fibrillation, (4) Congestive Heart Failure, etc. This, then, implies a classification of our original diagnostic or descriptive term.

Such considerations may appear purely academic and entirely obvious. They are, nevertheless, of some importance, since the terms we use are the means of imparting ideas or information. The more exact the terms, the more homogeneous is the group to which they apply, and the more reliable the results of studies as applied to any individual in the group. It is granted that in many areas we lack sufficient knowledge to so classify, but, if studies, particularly in regard to the effects of treatment, are to be valid, the group studied should be as homogeneous as current knowledge permits. Otherwise we find that studies by different observers provide differing conclusions. For example, reports on the effect of Mysoline in Petit Mal show widely differing results, which can ultimately be traced to the fact that some observers use the term in a very restricted sense, others in its broadest sense, and still others fail to define what meaning they attach to it. The problem, then, may be primarily one of semantics—but it is still a problem and often a large one.

If we accept that the problem of nomenclature and classification exists, we may next ask "What are the criteria of a good classification?" I suggest that they are as follows:

(1) It should, as far as possible, be based on current concepts of anatomy, physiology, pathology, clinical features, etc. of the subject.

(2) It should carry implications regarding the management of any given subdivision.

(3) It should be adaptable to changes in our concepts as knowledge advances.

(4) It should, in the main subdivisions at least, utilize terms which are relatively simple, not ambiguous, and which convey the same meaning to all who come in contact with them.

(5) It should include all the currently recognized varieties of the subject, without specifically altering or modifying the meanings of currently used terms.

(6) It should stimulate a critical re-appraisal of commonly accepted ideas on the subject, and thus lead to increased knowledge thereof.

We should now examine current classifications of epilepsy in the light of these criteria—particularly the first four. There are, of course, quite a number of classifications, but certain terms commonly recur in them. We may, then, assess them by simply indicating what meaning is attached to these terms. This, in itself, may tell us whether they are satisfactory.

Some of the commonest of these terms are:

(1) Petit Mal Epilepsy: literally a small sickness or attack. The term, however, is used by some to indicate a specific brain wave pattern; by others, to indicate this pattern in persons who suffer brief, myoclonic, akinetic, or mental lapse attacks; and by still others, to indicate all these, plus any brief, non-convulsive seizure of whatever origin, or type, as long as there is some disturbance of consciousness, e.g. temporal lobe lapses. It is obvious that the significance of these may vary considerably.

(2) Grand Mal Epilepsy: literally a great sickness or attack. This signifies only that there has been, at some stage in the attack, a generalized convulsive episode—regardless of its source in the brain. As a clinically descriptive term it may be defended, as a diagnostic category it leaves much to be desired.

(3) Psychomotor Epilepsy: was originally defined by the Gibbses and Lennox[1] as "a period of impaired consciousness, or amnesia, with apparently purposeful movements, sometimes accompanied by manifestations of emotional excitement." If the same picture occurs with a generalized convulsion, however, it may be called Grand Mal; whereas if only the first part occurs (i.e. Impaired consciousness or amnesia) it may be called Petit Mal; yet both the source of the abnormality and the clinical significance are the same, in the face of three differing diagnostic terms.

(4) Idiopathic Epilepsy: literally, of unknown cause, and, thus, the term "idiopathic" may properly be used if study does not demonstrate a cause. The cause, however, may not be entirely unknown —e.g. the source of the abnormality may be known, and even some idea of the pathology may be assumed, by inference, from clinico-pathological studies. Thus, idiopathic epilepsy is never a diagnosis; the word, if used, must be further modified. On the other hand, some authorities reserve the word to mean only those epilepsies in which the initial manifestation is a loss of consciousness, and, in which there is a specific abnormality of the electrical activity of the brain.

There are, of course, many other commonly used diagnostic terms — e.g. Focal, Cryptogenic, Jacksonian, etc., which overlap to a greater or lesser degree the above examples. I trust these few will illustrate the confusion which must result when a "non-epileptologist" attempts, in his reading to learn how to handle his patient.

This existing confusion is, of course, well recognized by authorities in the field, and is

exemplified by recently renewed interest in the problem of classifying epilepsy[2, 3, 4]. Suggested classifications however, do not satisfy the six prerequisites. There are two possible exceptions, viz:

(1) The classification of Penfield[5] which may be quite satisfactory to the student of epilepsy but seems too complex for the practising physician and (2) The classification of Symonds[3] which tabulates any given case under five headings: clinical—anatomical — physiological — pathological — and therapeutic: which is theoretically excellent, but would require use of five separate descriptive words or phrases, preceding the group word epilepsy and thus seems impractical and cumbersome.

Cobb[6], in taking the opposite approach, denies the need for a classification, and implies that epilepsy means only that the person has recurrent seizures needing study and treatment. This type of thinking can, of course be applied to any sign or symptom in medicine, yet classifications are universal. They may exist only as memory aids, but, since the majority of us think better in a concrete, than in an abstract form, they are obviously useful.

It is undoubtedly true that our knowledge is not, as yet, precise enough to perfectly classify epilepsy. It should still be possible however, to devise a practical, "working" classification, which would satisfy our criteria and be of assistance to the practising physician. It is assumed that the "epileptologist" does not require such a classification for study and treatment of the symptoms. In the light of these considerations, I propose then to offer a classification designed to aid the practising physician in his thinking about epilepsy. But first, we must define epilepsy.

Definition

Epilepsy is a spontaneously recurring, brief, paroxysmal disturbance, of varying intensity, of the functions of the brain; associated, at least during the paroxysm, with an abnormality of the electrical activity of the brain, the source and mode of spread of which coincides with, and appears to determine, the clinical manifestations of the disorder; among the commonest of which are a change in awareness and/or involuntary convulsive movements. This definition, by its reference to electrical activity, introduces the Electro-encephalogram (E.E.G.), which is the instrument usually used to record such activity. Although we do not have precise knowledge concerning the production of the E.E.G. patterns, we do, at least, have considerable evidence concerning which areas can, by increased electrical activity, produce an epileptic attack. Before dealing briefly with these areas, it should be mentioned that the older concept of cortical grey matter, with its underlying white matter and subcortical grey matter, is giving way to a newer concept of differentiation into Thalamo-Cortical Sectors: i.e. a spatial or three dimensional picture. We may mention one such sector as an example, viz: The Somato-Sensory (Post-Central) cortical grey matter, with the neurones connecting it to the medial and lateral ventro-posterior nuclei of the thalamus. Anatomically, this may be thought of as a sector of a sphere. Gastaut[7] has shown that the grey matter at either end of such a sector can be made to become epileptogenic, although, more usually, it is the cortical end which does so. Also, the grey matter (reticular formation), of, (at least) the upper brain stem, may become epileptogenic, especially "where the bilateral structures are just at their point of divergence and where they can all be activated at the same time." We have, then, to deal with the grey matter at either end of any cortico-thalamic sector, plus the grey matter of the reticular formation, as possible sources of epileptic activity, and only two areas, viz: cortex and reticular formation, as probable areas.

With this background, let us now consider the classification in its detail. There are, first, two broad groups, viz: Primary and Secondary. (Table one).

Table One
Epilepsy

Primary
- A. **Centrencephalic**
  - I. **Major**
  - II. **Minor**
    - (a) lapse
    - (b) myoclonus
    - (c) akinesia
- **B. Cerebral** — ? none
- C. **Extra Cerebral** — ? none

Secondary: State suspected cause if possible.
- A. **Centrencephalic**
  - I. **Major**
  - II. **Minor**
    - (a) lapse
    - (b) myoclonus
    - (c) akinesia
- B. **Cerebral:**
  - I. **Sensory:**
    - (a) Somatic
    - (b) Visceral
  - II. **Motor:**
    - (a) Somatic
    - (b) Visceral
  - III. **Physical:**
  - IV. **Unknown:**
- C. **Extra Cerebral:** e.g.
  - Hypoclycemia
  - Hypocalcaemia
  - Stokes-Adams attacks
  - Cough—Syncope
  - Porto-Systemic encephalopathy
  - Tetanus
  - Hydrophobia
  - Lead—Camphor—Barbiturate—Alcohol, etc.

The more important clinical diagnostic categories are in black face type.

I. Primary: is by definition — "original;" signifying, as it always has done in medicine, a self-originating disorder — without significant knowledge as yet, regarding causative factors. Others have called this group genetic as it is here that heredity apparently plays its greatest part. With advancing etiological knowledge, one would anticipate that this group will disappear, as it has in other spheres: e.g. anemias.

II. Secondary: by definition—"not primary—of second rank or kind." This group is often called symptomatic. The term "secondary" is preferred, since we may know that the seizures are SECONDARY to an area of abnormal function in, say, the temporal cortex, but we may not know whether they are SYMPTOMATIC of a microgyrus, a scar, a cortical thrombosis or other lesion.

There are, under each of these major groups, three sub-groups.

(1) Centrencephalic: Although this may be a new term to many, it is still easily interpreted to be the centre of the brain (encephalon)—i.e. that area "where the bi-lateral structures are just at their point of divergence." Since this area is intimately concerned with the function of consciousness, we should expect this group to demonstrate disturbances of consciousness as their earliest clinical manifestations. Such is, indeed, commonly the case. In the E.E.G., bi-synchronous abnormality is seen, i.e. abnormal waves, identical in time and form, from each hemisphere, at least during the attack. Between attacks, larval forms of the same abnormality are seen, or the record may be normal. There are two clinical forms of centrencephalic epilepsy:

(a) Major: characterized by initial loss of consciousness, without aura or warning, and without any "cry," except that of the forceful expulsion of air through the larynx, which, if it is present, occurs after loss of consciousness. This is followed by generalized muscular tonus (20 secs.); then gradually decreasing frequency of generalized, clonic, muscular contractions (40 secs.); followed by recovery in three to forty-five minutes.

(b) Minor: There are several clinical varieties of minor centrencephalic epilepsy — only two (? three) of which, are at all common in occurrence.

(i) Lapse attacks, which are five to fifteen second periods of suspension of mental functions, including consciousness, and are commonly repetitive, (ten to fifty or more per day). These commonly occur in younger patients, and are relatively easily precipitated by hyperventilation. All this tends to differentiate this group from abortive major attacks, or from certain of the secondary epilepsies.

(ii) Myoclonic attacks: consisting of brief, bilateral, (usually flexor) jerks of upper limbs and trunk of varying strength, with, or without, recognizable change of consciousness.

(iii) Akinetic attacks: sometimes called inhibitory epilepsy. These are brief attacks of complete loss of muscle tone, with resultant fall, with or without, recognizable change of consciousness. Many authorities, including Gastaut, deny the existence of this group. Those extensively studied by Gastaut, all turned out to be abrupt, strong, single, myoclonic jerks.

(2) Cerebral:

(3) Extra Cerebral:

There are probably no Primary Cerebral or Extra Cerebral Epilepsies, so discussion of these terms will be deferred until Secondary epilepsies are considered.

Under Secondary Epilepsies we have the same three major groupings.

(1) Centrencephalic: Secondary centrencephalic epilepsy is rarely encountered, but occasionally follows, and is apparently due to, mesencephalitis of measles, chicken pox, etc. The same major and minor sub-groups apparently exist, but can be differentiated from the primary centrencephalic group only by inference from time relationships, and by the fact that the inter-seizure E.E.G. is always abnormal.

(2) Cerebral: As opposed to centrencephalic—This group usually, but not always, has its origin at the cortical end of the Cortico-Thalamic sector, as previously mentioned. It has also been called focal or partial epilepsy, but these terms have no specific meaning. There are certain features common to the group:

(a) Consciousness is not necessarily lost, but, of course, may be, depending on degree of spread of the discharge.

(b) The clinical manifestation may remain quite localized (e.g. to one arm), or may "march," relatively slowly, or extremely rapidly, to produce a generalized seizure; but no matter how rapid the spread, the subject or the observer may have noted the initial so-called "aura" which is the onset of the seizure. Stated in reverse, any epileptic patient who has an aura, has a Cerebral type of epilepsy, as opposed to a Centrencephalic type.

(c) The E.E.G. abnormality is of two general kinds.

(i) localized abnormality from one or more recording areas.

(ii) diffuse abnormality, which is not bi-synchronous as in the centrencephalic group. Such abnormality may or may not be more marked on one side or the other. This is the type of abnormal record commonly seen in cases of temporal lobe origin, also called Psychomotor epilepsy.

Furthermore, as opposed to the centrencephalic group, the inter-seizure record is practically never normal.

Sub-groupings under this heading should ideally correspond with the anatomic sector initially involved. As we lack precise anatomico-physiologic correlations in some areas, a broad clinical classification is preferred, on the basis of cortical functions

commonly accepted, and their clinical counterparts, as they are the INITIAL manifestations of the seizure. This is so regardless of whether these are the only manifestations, or whether a generalized convulsive episode follows.

As indicated in the table, the suspected cause should be stated, where possible, and the term "localized" or "generalized" may be added, if desired. There are four sub-groups of the secondary cerebral epilepsies:

(a) Sensory— (i) Somatic— which may involve any of the special or general sensations, and constitute, what has in the past, been considered as auras—e.g. Visual, Auditory, Vestibular, Olfactory, Gustatory, Exteroceptive, or Proprioceptive sensory abnormality.

(ii) Visceral—common is the so-called epigastric aura, but palpitation, pallor, flushing, nausea, etc. may also occur.

(b) Motor — (i) Somatic: may begin as clonic movements, tonic movements, turning or rotational movements, aphasic attacks, or automatism, (apparently purposive, co-ordinated muscle contractions, which accomplish no useful purpose).

(ii) Visceral: uncommon; but disorders of gastro-intestinal motility, respiratory arrest or tachypnoea, and possibly vaso-motor changes may occur.

(c) Psychical—Illusions or hallucinations, affective or cognitive disorders may begin an attack and may vary from a simple lapse-like state to a complex march of psychical symptoms.

(d) Unknown: i.e. Secondary cerebral epilepsy of unknown type.

(3) Extra-Cerebral: i.e., seizures which are only one manifestation of more general disorders, some of which are listed in the table. This group is included only for sake of completeness.

It will be noted that the general meaning of commonly existing terms has been unchanged in the above classification, e.g.,

(i) Petit Mal: is still a small seizure, featuring mainly, a brief disturbance of consciousness; though, since it implies nothing of its possible origin, it should not be used alone.

(ii) Grand Mal: is still a generalized convulsion with loss of consciousness, but also should not be used alone, and for the same reason.

(iii) Status epilepticus: is still a series of seizures without apparent free interval, regardless of the nature of the seizures and, as before, should preferably not be used unmodified.

(iv) Idiopathic: still means unknown cause, and may, properly, be used as an additional descriptive term in the classification.

We should now check this classification against our six criteria.

1. It is based on our current concepts of origins of the epileptic discharges.

2. The major sub-groups do carry meaning regarding management, etc. provided, of course, the diagnostic criteria for each group have been fulfilled. For example:

(a) A secondary cerebral epilepsy calls for more extensive search, for a correctable cause, than any Primary epilepsy.

(b) Primary centrencephalic minor epilepsy is the only group likely to respond to the "diones."

3. It is elastic enough to be adaptable to changing concepts.

4. The terms used are relatively simple and about as unambiguous as English words can be.

5. All currently recognized varieties of epilepsy are included and the meaning of currently used terms has not been altered.

6. At least one new question immediately arises, viz. since Gastaut[7] and Williams[8] are agreed that the abnormal neurophysiology is essentially the same—at least in the Primary epilepsies—why, apparently, are the "diones" effective only in the minor variety and seem to aggravate the major variety? Possibly there is a key here to the chemical disturbance underlying the abnormality; or possibly our clinical assessment of the "diones" needs reviewing.

Finally, I would hope that if such a classification were followed in assessing any given patient with seizures, the all too common errors of management, to which we are prone, might be, if not abolished, at least reduced.

In summary, I have attempted to point out the need for a revision of the current classification of epilepsy, and the criteria which such a classification should satisfy. On this basis a classiffcation has been presented for the use of the practising physician.

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Obstetrics

Foetal Death in Utero After the Seventh Month of Pregnancy

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Foetal death in utero after the seventh month of pregnancy may be further defined as death of the foetus in utero after the 28th week. (This definition generally excludes foetal deaths due to mechanical difficulty or accident associated with the hazards of labor itself, e.g., prolapsed cord, intracranial hemorrhage, etc.). Most of these foetuses will be macerated as compared to those which perish during labor and are referred to as fresh. The incidence of foetal death in utero varies of course in different centers, but a representative figure is that of Guys Hospital, where in 11,147 deliveries, the total stillbirth rate was 3%, and of these 1.1% were macerated. In some cases, the cause of death of the foetus is obvious, e.g., abruptio placentae, hydrops foetalis, etc. For the most part however, there has remained a large group of cases, the majority of these foetal deaths in utero, for which there has been no apparent cause. This group has been one of the enigmas of obstetrics. Anyone who has had much obstetrical experience is familiar with this type of case. An apparently healthy patient, whose prenatal course is often normal—no evidence of toxemia, no bleeding, nothing unusual to excite the least bit of alarm, will report the sudden absence of foetal movements near term, foetal heart sounds are absent, and eventually she is delivered of a macerated stillborn foetus. There is usually no known cause or reason for these tragedies. It is this type of case, as well as the stillbirths due to more obvious causes, which will be considered here.

No extensive attempt to discover the reason for these deaths was made until the last thirty to forty years, mainly due to incomplete statistical surveys, a low incidence of and often incomplete autopsy studies, and an even more limited knowledge of intra-uterine physiology than we now possess.

However, in 1922, an investigation into "The Causation of Foetal Death," published by Sir Eardley Holland, showed that at that time, syphilis was the commonest cause of death, accounting for almost one third of all macerated stillbirths. More recent analyses of the causes of foetal death give much less prominence to syphilis and the evident decrease in deaths from this cause is probably the result of better ante-natal care and of more efficient treatment of venereal disease.

A very large portion of ante-partum deaths still remain unclassified up to recent years, even though more extensive studies have been carried out to determine their cause. For example, Gibberd reports in his text book as recently as 1951, as follows:

123 Cases of Macerated Foetuses

Toxemia and Nephritis	37	30 %
Placental Insufficiency (cause)	10	8 %
Syphilis	2	1.6%
Other Constitutional Disease	3	2.4%
Premature Separation Placenta	2	1.6%
Poor Maturity	2	1.6%
Gross Errors of Development	3	2.4%
Hy Drops Foetalis	2	1.6%
Undetermined	42	50 %

Note the great reduction in foetal deaths due to syphilis. Note also the very large percentage (50%) of cases in which the cause of death was undetermined—which in itself speaks of our great lack of knowledge of intra-uterine and placental physiology. Toxemia and Nephritis account for a large percentage due to interference with the circulation and oxygenation of the foetus. "Placental insufficiency" is a vague term and the cause of such insufficiency is generally obscure except when the placental disease is associated with toxemia. The placenta in these cases is either much smaller than one would expect it to be for the duration of pregnancy or else it is considerably infarcted. Unfortunately the placenta is often found to be in this condition in many normal cases, which again points out our lack of understanding of its physiology. Post maturity is often impossible to establish as a diagnosis and we all know that in many cases pregnancy exceeds forty weeks without any ill effects on the foetus. Sometimes, however, excessive senile changes occur in the placenta and the foetus shows some of the so-called signs of post-maturity and the case is labelled post-mature. Gross errors of development, though not necessarily incompatible with intra-uterine life, sometimes cause death of the foetus before onset of labor and in this series accounted for 2.4% of the cases. Sometimes, some serious constitutional disease of the mothers, either an acute fever or a chronic condition such as diabetes may be responsible for a macerated foetus and this type of case was responsible for 2.4% of the deaths. Rh-Iso-Immunization due to the conception of a Rhesus positive foetus by a Rhesus-negative mother may result in hydrops foetalis and often in this condition the foetus dies in utero—1.8% in this series. Again the striking feature in this series is the 50% of ante-partum deaths for which no cause could be found.

Considerable effort is now being expended to reduce the number of ante-partum foetal deaths. It follows that in order to reduce the number of ante-partum deaths, a better understanding as to their cause must prevail. And so intensive studies into the physiology of the foetus and the function of the placenta are being carried out. Pathological surveys of intra-uterine deaths and stillbirths in

general are being carried out in several places and the placenta itself is the subject of much research. This 50% of cases for which no cause of death is apparent is the object of attack. The great progress made in the study of Rh-Iso-Immunization has cut into this unknown group. Many cases previously diagnosed as unknown, have been shown to be Rh deaths. But still there remains a large proportion of cases in which the explanation of foetal death is still quite obscure.

In the past few years, a study of these cases has been carried out locally at the Winnipeg General and St. Boniface Hospitals. An attempt has been made to classify all stillbirths as to cause. Autopsies have been performed on a very high percentage of these foetuses and all the placentae have been carefully examined.

The following chart presents the intra-uterine foetal deaths at the Winnipeg General Hospital from April 1952 to the present. Autopsy rate was 95%.

90 Cases

Toxemia	14.9%
Placental Insufficiency	10.4%
Diabetes	2.3%
Abruptio	14.9%
Placenta Praevia	2.3%
Gross Errors in Development	18.4%
Rh Deaths	8.0%
Hemorrhage, Cause Unknown	4.6%
Unknown	24.1%

If we compare this series with the previous one, there are some striking changes.

Toxemia — Responsible for 14.9% of deaths. These are anoxic deaths due to interference with the placental circulation. The decrease in number from the previous series is the result of better pre-natal care—both in the prevention and management of this complication.

Diabetes Mellitus—2.3% of deaths. Some toxic factor which is present in the diabetic mother (and which has not been identified) is responsible for most of these deaths. This toxic factor seems to be particularly evident in the last month of pregnancy.

Abruptio Placentae—14.9%. Many of these are associated with toxemia of pregnancy. The cause of death is anoxia, due to the separation of a fairly extensive portion of the placenta. Occasionally, maternal shock is responsible for foetal death.

Foetal Abnormalities — 18.4%. Abnormalities incompatible with foetal survival accounted for this figure. The increased exposure to X-radiation during recent years may have some influence on this high figure.

Rh Deaths—8%. The increase due to this cause is accounted for by the greater knowledge of this condition, more general Rh testing and, improved autopsy studies. As a result, many cases previously classified as stillborn due to unknown causes have now been shown to be due to Rh Iso-Immunization. Also this percentage is not a true reflection of its incidence in the general population as the Winnipeg General Hospital is a centre to which many of these cases are referred for management.

Unknown—24.1%. Note the tremendous reduction in deaths due to unknown etiology (i.e.—50% previous series). This reduction is the result of better understanding of intra-uterine physiology and a much higher incidence of autopsy studies. As a result, many deaths previously classified as unknown are now classified as to actual cause, e.g., Rh deaths, diabetes, etc. Many of these previously unknown deaths, however, are now classified as being due to placental insufficiency. Since the cause of placental insufficiency is as yet unknown, except where it occurs with some other factor (toxemia, abruptio, etc.) we are actually lifting statistics from one column, about which we know very little, and placing them in another column, where we are equally ignorant. The net result of all this is that the largest groups of these intra-uterine deaths still occur from unknown causes. If we group together the unknown and placental insufficiency cases, their total still accounts for about 35% of all cases. Many factors have been blamed for these unknown deaths, e.g., nutritional deficiencies, constitutional gynecological factors, male deficiencies, endocrinological factors, familial incidence, etc. All these various explanations are unsatisfactory as being responsible for 35% of intra-uterine deaths. They are all broad, non-specific terms and contribute very little to an understanding of the problem. Occasionally cord abnormalities, e.g., true knots, cord wound around the foetus many times, may be responsible for intra-uterine foetal deaths, but this is true probably only in a very small number of cases.

The problem is how to reduce the incidence of intra-uterine Foetal Death. As previously mentioned, if we are to appreciably lower the incidence of intra-uterine death, we must:

1. Review all foetal deaths with proper autopsy studies to determine their cause.
2. Aim at a better understanding of placental and foetal physiology.

For the present however, we can improve our results from known causes as follows:

Toxemia

The answer here is to prevent toxemia. This can be largely accomplished by better pre-natal care. The careful observation of weight gain, blood pressure and albuminuria will prevent toxemia in many cases, or, failing in prevention, will enable earlier and more intensive treatment to be carried out. This includes earlier hospitalization and if indicated, earlier induction of labor. Pregnancy should not be allowed to continue in the face of severe toxemia, (which does not respond to treatment) supposedly in the interest of the maturity of the foetus, as the deleterious effect of the toxemia will more than outweigh the questionable advantage gained by further maturity in these cases.

Placental Insufficiency

Since our understanding of this condition is limited, little can be done to prevent it. The problem of post-maturity can be considered under this heading. Prolongation of pregnancy beyond the 42nd week of gestation is held by many to have a harmful effect upon the foetus, as a result of excessive aging of the placenta. The foetus is said to have outgrown the placenta, and anoxia is the result. The diagnosis of this condition is at best uncertain, because of mistaken dates, etc. The treatment recommended is induction of labor at 42 weeks of pregnancy. It is obvious that if this course of treatment was to become routine, more infants would be lost as a result of prematurity than would be saved from post-maturity.

Diabetes Mellitus

Foetal loss with this condition remains high. Closer supervision of these patients during pregnancy is most important, especially with regard to the control of diabetes, and the prevention of toxemia and ketosis. A toxic factor which becomes more incident in the last month of pregnancy causes intra-uterine death in a large proportion of cases. Interruption of pregnancy at about 37 weeks, either by induction of labor or Caesarean Section is recommended.

Abruptio Placentae

Part of the answer here is to prevent toxemia, as these two conditions are often associated. Perhaps earlier resort to Caesarean Section in cases where the foetal heart rate is still good would salvage a few more infants. Foetal loss with this condition, however, remains very high.

Gross Errors in Development

Severe abnormalities account for a large proportion of intra-uterine deaths. By and large, prevention is impossible but certain measures can be taken:

1. Avoidance of exposure to radiation, particularly in the early months of pregnancy.
2. Avoid exposure and prevention of Rubella and other virus diseases.
3. Control diabetes.

Erythroblastosis

More extensive Rh testing and closer supervision of cases will help here. In the face of a rapidly rising antibody titre, interruption of pregnancy may be indicated.

Unknown Group

Not too much can be done to improve our results in this group at present. However, in the case of recurrent intrauterine death (cause unknown) in the last few months of pregnancy, termination of pregnancy at 37 weeks may be indicated.

Diagnosis

The patient will usually report the absence of foetal movement. Objectively, foetal heart sounds will be absent. There will be no increase in the siize of the uterus over a period of time, the uterus may appear smaller. The biological tests may be negative, and if so, are diagnostic. The test however, may be positive if any chorionic tissue is still functioning and may therefore be misleading. Other signs are regression of varicosities, softening of the breasts and the appearance of milk, improvement in signs of toxemia. X-Ray signs may be helpful. Spalding's sign (overriding of the cranial bones) usually appear in 5-7 days; spinal deformities may appear.

Management

It is advisable to await spontaneous expulsion of the foetus; this usually occurs in one to two weeks. A medical induction may be attempted, using castor oil, and pitocin after priming the uterus with estrogens. Should this fail, surgical induction as well as Caesarean Section must be avoided, as the danger of infection, especially of the gas gangrene type is too great. These cases are difficult to handle, as the patient will understandably wish her uterus to be evacuated once she knows the foetus is dead, and great pressure is often brought to bear on the attending doctor to this end. It must be emphasized, however, that surgical interference may lead to disaster and should be avoided.

Summary

There is a great deal we don't know in regard to the factors which cause intra-uterine death of the foetus. On the other hand what we do know has enabled us to reduce the incidence of these deaths from not a few important causes, and we can continue to do so by practicing better obstetrics and offering our patients better pre-natal care. In regard to that large group of cases, in which the cause of death is unknown, as our understanding and knowledge of the physiology and pathology of the placenta is expanded there will inevitably be a further great reduction in this group of deaths.

Psychiatry

Treatment of Alcoholism*

J. Matas, M.D.

The alcoholic comes to medical attention usually because he is seeking help for the immediate effects of the excessive consumption of alcohol. The appeal is sometimes made voluntarily by the patient, sometimes with partial coercion of the family. At other times it is entirely at the instigation of the family or some agency such as A.A. These effects may be quite severe, as in a state of delerium tremens; or they might be milder, a matter of feeling sick and miserable, or having the "shakes." It may be too, because the patient is seeking help in coming off a binge and he is fearful of the effects of stopping to drink that he continues in spite of not wishing to do so.

It is generally agreed that the place for the treatment of acute alcoholism is in a hospital and if at all feasible, in a General Hospital. It is surprising how little difficulty most acutely alcoholic patients cause in hospitals when properly treated. This includes those in delerium tremens, if the patient can be given adequate supervision, as under the usual regime, the acute psychotic stage lasts a short time.

St. Boniface Hospital has, whenever possible, admitted alcoholics for treatment — it has never taken a "holier than thou" attitude toward them. However, we run into a variety of difficulties in the treatment of this illness. One is the matter of beds. There are not very many psychiatric patients who cannot wait a day or two or even longer if necessary for a bed. Even an acutely depressed patient with suicidal ideas can be supervised at home and kept under control by sedation. But when an alcoholic has decided on his own or with the help of his family that he requires treatment, he needs to be given treatment right away. He usually refuses or is too sick to wait. As a result many have to be turned away or treated on an ambulatory basis, who should be admitted. The only solution is that beds be set aside in a hospital or in some special unit for the treatment of acute alcoholism. In Winnipeg, with the chronic shortage of beds, I can not see this happening in any general hospital. It is unlikely that any hospital will give preference to this type of case. It is difficult to disabuse ourselves of a previously held idea that the alcoholic is a perverse person who becomes alcoholic because of this, and that the outlook for alcoholism is always poor and treatment is not worth the effort.

With the best will in the world and even with an abundance of beds, one would have to choose who would or would not be admitted. It is obvious that the skid row alcoholic for example, could not obtain much benefit from a short stay in hospital. This type of alcoholic loves to come into hospital for as long as we will let him stay. He will be more or less sober while in hospital, but very little is accomplished ever in these cases. What has been done in the hospital is that we, if possible, take in any case once, but having assessed the individual as one who needs long term care, we will not admit him again and again. The casualty keeps a list of such a group who have been here, and they are refused admission again.

There are standing orders for the treatment of acute alcoholism in the casualty and on all the wards. As these standing orders are written, it is not specifically so stated, but it is taken for granted, that no further alcohol is to be given to the patient. There are exceptions to this rule where the patient is debilitated or suffering from severe illness, because it is pretty well established that delerium tremens is precipitated by withdrawal. This view is not universally accepted, but there is a great deal of evidence in its favor. Nevertheless, I think it is important that alcohol be withdrawn, because in treatment of an alcoholic we cannot assume the position of condoning the drinking and helping to perpetuate a vicious circle. The measures outlined in the standing orders are given every acute alcoholic patient to prevent the serious effects of withdrawal, and when these effects are apparent, curtail them.

The management of the acute alcoholic state may be conveniently subdivided into three[1] parts.

(1) Correction of existing physical and physiological abnormalities. This would include correcting abnormalities of fluid balance, correction of salt and nutritional deficiencies when they exist, and diagnosis and correction of existing diseases. After a severe bout there will be some dehydration, and some people feel there is a specific and significant loss of sodium chloride accompanying any acute alcoholic episode. This salt depletion is, in the opinion of some, a major factor in the patient's compulsive drinking. The giving of salt either intravenously or by mouth is therefore indicated. The usual dose in the first 24 hours is 2 to 4 grams of salt. As you know, on a binge the alcoholic eats very little and it is therefore necessary to supplement his diet by vitamins. Vitamin B1 is usually given by injection intramuscularly in fairly heavy doses for a day or two, and later by mouth. Other vitamins can be given by mouth. The intramuscular route is a preferable one for vitamin B1 because if given intravenously, many allergic reactions are seen.

(2) The management of symptoms associated with acute alcoholic intoxication. In this area the central part of the treatment has become the intravenous injection of glucose and insulin. The rationale of this treatment is not at all clear. There was some vague idea that the insulin and

*Presented at a clinical luncheon at St. Boniface Hospital.

the glucose speeds up the metabolism of alcohol in the body, but this has never been proven. Another suggestion is that its beneficial effects may result from its enforcement of the utilization of glucose by the various body systems instead of the circulating alcohol. A further suggestion is that it may help to rapidly re-direct enzyme systems perverted in their normal function by a steady environment of alcohol. However, it is generally accepted that it works. The more severe the hypoglycemic reaction, the more effective this treatment is. In the standing orders here, you will find that it is advised that a second dose of glucose be given without insulin an hour after the first. This is put in routine orders as a precaution against the patient being left in dangerous hypoglycemia. In a situation where a patient is under close supervision, the ideal procedure would be, to leave the patient alone until the hypoglycemia is evident.

Most people also use either A.C.T.H. or cortisone. This comes about, largely through Smith's[2] work. He feels that alcoholism is an endocrine disease and treats alcoholics with one of the extracts of the anterior pituitary or the adrenal gland and other androgens. Whether this theoretical foundation is firm or not, does not matter, as again most people feel that A.C.T.H. does help. It certainly does seem to lessen the need for sedation in the acute alcoholic state and reduce the incidence of delerium tremens.

(3) For the management of symptoms associated with the immedate post alcoholic state, such as marked tremor and tension, sedatives will be necessary in most instances. If the restlessness is severe, Serpasil, intravenously in large doses is useful as a basic sedative. In addition other sedatives can be given. There is some hesitation in using Largactil or Sparine, because of its liver effects. The old standby Paraldehyde, is still used and occasionally barbiturates. Convulsions are sometimes a feature of the post alcoholic state, and it is because of this, that we have included Dilantin as part of routine orders.

Most of our contacts with alcoholics is restricted to treatment of this nature. The worst that could be said about it, is that it accomplishes nothing from the long range point of view, but it does ease a great deal of suffering and the possibility of a serious tragedy may be avoided. Patients have died in D.T.'s. The best that can be said for it, is that it gives us an opportunity for orientation of the patient to the real nature of his illness, and to begin the over-all long program necessary for its alleviation and the patient's rehabilitation. Certainly, no patient is discharged from the hospital before a few fundamental facts are pointed out to him, such as, that he is an alcoholic, that he will never be able to drink socially again, and that he needs continued treatment. We try to talk him into accepting an A.A. contract and we arrange this if the patient will accept it.

One of the problems that has to be decided with each individual patient is how long to keep him in hospital. Most patients probably decide this for themselves, but some will stay as long as they are advised to. Having got over the most severe effects of his bout the patient is not entirely over all of the effects. The danger is that if he is discharged too soon he will be more likely to reach for a drink. However, it is apparent that in a setting such as we have here, we cannot keep the patient for a really long time, that is, for a matter of months. Some compromise has to be reached, three weeks usually. However, if a patient, after the immediate post alcoholic phase, seems to be suffering from an acute anxiety state or depressive illness which would benefit from longer hospital treatment, he is kept and given treatment.

Many plans have been offered for the long range treatment of the alcoholic. Some have been used here, others not. Williams[3], a biochemist, put forth a theory that alcoholism is a metabolic disease of a hereditary nature. The illness is of such a nature that to keep healthy the individual needs a higher quota of vitamins each day than the average person and he claims to prevent recurrences of drinking by giving heavy doses of vitamins. In most hands this has not proved effective.

Others have put forth a theory, as I have mentioned, that there is some sort of endocrine disturbance, an adrenal depletion in chronic alcoholics. They claim good results with treatment based on this theory. I think it is at best, a supplement.

The use of Disulfuram (Antabuse) is widespread. Some workers feel that this is the most important advance in the medical treatment of alcoholism that we have. One writer[4] reports that it helped 80% of 118 patients he was able to follow. Half of these never drank again, the other half had minor relapses. My experience here has not been nearly as good. For one thing, I seem to be able to persuade very few patients to take it. Perhaps the people we see here are not ready to stop drinking. However, I only offer it to a patient as a second choice to A.A. Furthermore, so many alcoholics, when they are dried out in hospital are so sure that they will not drink again that they feel it unnecessary. This, probably is another way of saying that they haven't as yet accepted the need to stop drinking. However, I should point out that it may be my approach that is at fault. This is an extremely important facet in the treatment of alcoholics, and is one reason why A.A. succeeds where we fail. The ex-alcoholic does not talk down to the patient, and perhaps I do. However, this is certainly one illness that one should keep in mind, "There, but for the grace of God, go I."

Frequently I am asked by relatives of alcoholics if I can give them something to put in the patient's coffee or other food unbeknown to the alcoholic, which would make him sick if he drank. I have

never consented to this. This is generally frowned upon, because unless the patient knows that he had Disulfuram in his system, he has no protection; he is merely in a position to be poisoned or to unknowingly poison himself. Ideally the patient should take the pill without any encouragement from his family. However, I do find that in some instances, it is better to let the spouse take charge of the medication.

There are side effects from this drug which can be eliminated by reducing the dosage. One I have seen most commonly is fatiguability, although drowsiness, headache, loss of appetite and nausea is also seen. The only serious toxic reaction is a psychosis. This was more common in the early days of using this drug when larger doses were used than are used now. This psychosis clears up very quickly after stopping the drug and the patient can be continued on a smaller dose after that.

Disulfuram alcohol reaction can be a very severe one. It starts by flushing, headache, nausea, salivation, burning of the eyes and dyspnea usually about 10-20 minutes after digestion of alcohol. If severe, the reaction progresses to hypotension, vomiting, further dyspnea, pallor cyanosis and a feeling of tightness in the chest. Ultimately severe hypotension and extreme weakness and collapse can ensue. Treatment consists of the administration of antihistamine drugs and the conventional treatment of shock.

The question arises as to whether this drug can be given to patients who have liver damage. It has been given to these patients without any apparent adverse effects.

Some centres start the treatment with Disulfuram by giving the patient the drug plus alcohol. Most patients to whom I have explained this have refused to take the test and are willing to accept my say so regarding the danger of drinking while taking the drug.

Antabuse is the most talked of chemical treatment for alcoholism but there are others used in various centres, the best known of which is the aversion treatment. Here, the patient is given alcohol while under the influence of emetine or apomorphine to set up a conditioned reflex of revulsion when confronted with alcohol. This treatment has not achieved great popularity, although there are some enthusiasts. I have not used the aversion treatment, as it needs a pretty elaborate set-up and it is time consuming, and most reports are not too encouraging.

The sincere alcoholic who wishes to get over his alcoholism feels that there has to come about a fundamental change in himself so that he can live in a sea of alcohol as we do and feel that this is not for him. In other words, the fundamental of treatment is psychological and one of the first steps in it is the need for the alcoholic to admit that he can not control alcohol. This is one of the greatest hazards the alcoholic has to overcome—the full and free acknowledgment that alcohol has him beat, and that he will never be a social drinker. This is a fundamental fact that has arisen from recent studies of alcoholism, that there really is no cure in the sense that the alcoholic can become a normal drinker again. The only way he can rehabilitate himself is never to drink alcohol. I had one patient who abstained for fourteen years, and on the eve of his retirement decided that he was going to drink socially again. Immediately the same patterns of drinking were set up that had been present in the years before he had stopped.

The nature of the psychological treatment need not always be the same[5]. Most psychotherapists do not report very good results with individual psychotherapy alone but Strecker[6], who has had a lot of experience with alcoholism, reports very encouraging results from his own type of therapy.

Presently the most popular and the most effective form of psychological treatment of alcoholics is A.A. I invariably recommend it and will only start psychotherapy if the patient will not or cannot accept A.A., or if he needs additional psychotherapy besides A.A.

There are many facets to the treatment of the alcoholic. It has become clear that he is often not helped by his friends and relatives "sticking by" him. It delays his accepting the fact of his alcoholism. An interesting sidelight related to this is the observation that wives of some alcoholics have to keep their husbands alcoholic in order to fulfill their own emotional needs. I have a woman patient now, whose greatest problem was her inferiority feelings which originated with her mother's deprecating attitude. She found fulfillment in supporting and generally looking after a drunken husband. When he stopped drinking she again felt unneeded and useless.

Ruth Fox[7] points out that just as there is no single explanation for alcoholism, so there is no single treatment. The results of various types of therapy carried on during the past ten years have shown remarkably similar rates of recovery regardless of method used. The three points of similarity in the various successful techniques seem to be, a sincere desire on the part of the patient to get well, an acceptance of the alcoholic as being ill rather than perverse, and a hopeful attitude toward his ability to arrest the condition.

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Bacteriology

The Schick Test and Diphtheria

F. T. Cadham, M.D. and J. C. Wilt, M.D.

Today the majority of the children of this country are immunized against diphtheria in infancy or early childhood at an age when they readily tolerate the specified dose of the immunizing product. A preliminary Schick test is not required. As one of the results of the steady decline in the incidence of diphtheria a percentage of parents, in some areas, have developed a complacent attitude and have failed to have their children immunized, hence the number of susceptibles in those areas has increased. With a greater proportion of the population susceptible and in the presence of other contributory environmental factors the epidemic hazard is increased.

In the presence of an outbreak of diphtheria efforts are immediately made to have the susceptible segment of the population immunized. Since a number of these persons have reached an age when they may have acquired a natural immunity, or they may react to the immunizing product, a preliminary Schick test and Schick control test on these persons is advisable. The purpose of this paper is to discuss briefly a few of the salient factors associated with the Schick test and to present the results of the Schick tests carried out by this department on students of the Medical School of the University of Manitoba over a period of 29 years.

The Schick test is employed to indicate whether or not an individual is immune to, or is susceptible to diphtheria. Two products are supplied by the accredited biological institutes for the performance of these tests, one, diluted diphtheria toxin for the Schick test proper; and two, a product for the Schick control test used to determine if the individual is sensitive to the material which is supplied to immunize that individual, should the Schick test show immunization to be desirable.

A suitable site for Schick test injections is the flexor surface of the forearm. We use both arms, the left for the Schick test proper and the right for the control; both injections, if suitably spaced, may be made in the same forearm. The sites to be injected are cleansed with ethyl alcohol and sterilized cotton wipes. Particular care should be exercised to make the injections entirely intradermal. The present accepted standard amount of each product injected is 0.1 cc. However, in using these specially prepared products both for testing and for immunization purposes, it is advisable for the physician first to peruse and subsequently to follow with care the directions enclosed in the package by the Biological Institute supplying that particular product.

Interpretation of the Schick Test and of the Schick Control Test

1. Complete negative reaction—no erythema or other reaction is present at the site of injection of the Schick test material nor at the site of injection of the control test material. The individual is considered to be relatively immune to diphtheria and is not hypersensitive to the constituents of the test product. No immunization is indicated.

2. Typical positive reaction—in 24 to 48 hours an area of erythema accompanied at times with a slight swelling begins to appear at the site of the injection of the toxin. The reaction becomes more pronounced daily, reaching its maximum at 5 to 7 days. The erythema, usually 3 mm. to 4 mm. in diameter, is characterized by a darker coloured centre which later assumes a brownish colour and subsequently desquamates, leaving for a time a small pigmented area of skin. The site on the forearm injected with the control material will show no erythema or swelling. This individual is susceptible to diphtheria and is not hypersensitive to certain proteins in the immunizing product and should be given the full course of immunization recommended.

Various grades of reactions at the site of the injection may occur from a typical positive reaction to a negative depending upon the titre of immune substances present in the individual.

3. Hypersensitivity reaction — an area of erythema develops around the site of injection on each forearm. The redness reaches a maximum intensity in 24 hours to 36 hours, then gradually fades to disappear in about 3 days time. This person is considered to be immune to diphtheria and does not require active immunization, but he is hypersensitive (a reactor) to one or more of the ingredients in the test material.

4. Combined reaction—the arm into which the control material has been injected shows an area of erythema at the site of injection which reaches a maximum degree of intensity in 36 hours, then fades and disappears in about 3 days. The individual is classed as a reactor. The arm into which the Schick test material has been injected also shows an area of erythema which develops within 24 to 36 hours at the site of injection; the reaction becomes progressively more severe reaching a maximum intensity in 5 to 7 days. This person is not immune to diphtheria and should receive active immunization. However, since he is also a reactor the diluted diphtheria toxoid prepared especially for the purpose should be used.

Occasionally the reaction will persist for 7 days or longer in both arms. These may be designated as uninterpretable reactions, and, when indicated, a serum antitoxin titration may be made.

Children under the age of 8 years rarely develop any severe reaction either local or general, following the administration of an immunizing dose of diphtheria toxoid. On reaching the age of 8 to 10 years a number of children who have not been actively immunized against the disease will have acquired a natural immunity and these individuals will give a negative Schick test. However, at 8 to 10 years of age a number of children will also have acquired or developed a state of hypersensitivity which is reflected by a positive Schick control test. It is advisable therefore to carry out both the Schick test and the Schick control test on persons over the age of 8 to 10 years before proceeding with active immunization. In children who have been immunized it is now general practice not to do any test prior to recall doses, but to circumvent the possibility of reactions by giving small doses of the immunizing product.

Those individuals with a negative Schick test are considered to have sufficient immunity, but those with a positive Schick test will require active immunization. The individuals of this latter group who are reactors as indicated by the Schick control test require special consideration. A number of these individuals may develop a severe reaction if given the standard immunizing dose of diphtheria toxoid. The degree of sensitivity shown by a reactor may vary widely depending on the individual.

Evaluation of the results obtained by the Schick test and the Schick control test indicates the number of susceptibles and immunes to diphtheria in the population and consequently the necessity for immunization of these susceptibles against the disease. These tests also disclose, one—the necessity that the designated immunization procedures for each individual be completed in full, two—the value of, and necessity for, booster (recall) doses at prescribed intervals, and three—the advisability for a Schick test and the Schick control test on individuals over the age of 8 to 10 years before proceeding with the immunization procedures against diphtheria.

Schick Tests in Medical Students

The Schick test with the Schick control test has been carried out in the Department of Bacteriology and Immunology on all students registered in the Faculty of Medicine, The University of Manitoba, during the past 29 years, previously reported in part[1].

Table showing the results obtained:

Class	Year	Number of Students	Schick Positive Per Cent	Schick Negative Per Cent
2nd Year	1928	47	12	88
2nd Year	1929	47	20	80
2nd Year	1930	47	21	79
2nd Year	1931	63	24	76
2nd Year	1932	46	35	65
2nd Year	1933	51	37	63
2nd Year	1934	47	38	62
2nd Year	1935	40	45	55
2nd Year	1936	45	45	55
2nd Year	1937	44	50	50
1st and 2nd Year	1938	138	50	50
1st Year	1939	56	50	50
1st Year	1940	59	63	37
1st Year	1941	59	50	50
1st Year	1942	71	50	50
1st Year	1943	69	48	52
1st Year	1944	67	37	63
1st Year	1945	70	24	76
1st Year	1946	71	25	75
1st Year	1947	95	21	79
1st Year	1948	72	12	88
1st Year	1949	73	24	76
1st Year	1950	72	22	78
1st Year	1951	75	24	76
1st Year	1952	80	19	81
1st Year	1953	63	16	84
1st Year	1954	75	17	83
1st Year	1955	72	23	77
1st Year	1956	68	18	82

These results show that from 1928 to 1942 there was a gradual increase of the number of students showing a positive Schick test increasing from less than 20 per cent until the number reached approximately 50 per cent of those tested. Subsequent to 1942 an approximate steady decline of the number of students with a positive Schick test on entrance to the Manitoba Medical School has occurred until the number of students with a positive test is now less than 20 per cent of those tested.

The gradual increase in the interval from 1928 to 1942 of the number of students giving a positive Schick test coincided with the gradual, but marked, decline in the incidence of diphtheria in the community. It is logical to surmise that the high incidence of immunes as indicated by the Schick test in 1928 resulted from a greater opportunity at that time to develop through sub-clinical infection a natural acquired immunity to diphtheria.

The reverse trend from 1942 to the present time showing a gradual increase in the number of immunes coincides with the introduction in children of immunization procedures against diphtheria some 20 years previously and the gradual extension of those procedures to include as many preschool and school children as possible. Hence, approximately 80 per cent of the students now entering this college give a negative Schick reaction. They have been artificially immunized.

Immunization of the medical students who gave a positive Schick test was carried out. The following year these students were again given a Schick test; all gave a negative result.

Two students who were Schick positive failed to take a course of immunization, each of these students subsequently developed diphtheria during their medical course.

Products obtained from the Connaught Medical Research Laboratories were used in making the tests and for immunization purposes.

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Congenital Malformations*

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The birth of an infant with a major malformation is a tragic outcome of pregnancy. The frequency of this event has not changed radically during the last half century, but the relative importance of malformations has increased as other forms of neonatal morbidity and mortality are yielding to modern management of pregnancy and the newborn infant. The exact incidence of malformations is difficult to determine because they occur in a broad spectrum of severity, because their presence is frequently overlooked during the newborn period and because there are differences in the intensity with which physicians look for them. Most newborn services find that roughly 1 per cent of their liveborn infants have early apparent major malformations. About half of these malformations are lethal for the infant during the first year of life. If one includes all malformations which are discovered before puberty, the figure rises to 4-5 per cent.

Attempts to prevent anomalies should be founded upon an understanding of the factors which produce them. Currently, three categories of noxious influences are believed capable of thwarting normal development, 1) abnormal genes which are present in the product of conception at the time of fertilization and which misguide its subsequent development, 2) environmental stresses which affect the embryo during the critical period of major organ development from the 2nd to 12th weeks of pregnancy, and 3) a heterogeneous group of conditions which may occur during the latter half of pregnancy. Unfortunately, many of our notions of the genesis of human malformations are based more upon analogy to experimental teratology and genetics than upon convincing and verifiable data obtained from human biology.

Prevention of genetically transmitted anomalies might be attempted in two ways—first by trying to prevent further dissemination of harmful genes, and second by measures to shield human germ plasm from the acquisition of additional mutations. The difficulties of controlling the dissemination of abnormal genes can be illustrated by a consideration of sickle-cell anemia. The recessive gene which governs the production of S-hemoglobin is present in about 10% of American negroes and can be detected by a relatively simple test. Since manifest anemia requires a double dose of the recessive gene, approximately 1% of the negro population could be expected to suffer from this unfortunate malady. Theoretically it would be

possible to eliminate sickle-cell disease if all negroes were tested for the trait and then by persuasion, legal action or sterilization the carriers were prevented from procreating. But such an invasion of personal rights would never be tolerated, particularly since each individual bearing the sickle-cell trait would have only about 1 chance in 400 of having an affected child. A less drastic method of controlling anemia would be to prevent two carriers of the sickle-cell trait from marrying each other, since their chances of producing children with anemia are theoretically 1 in 4. The eugenic approach becomes even less realistic when considering malformations with uncertain modes of transmission or which lack a simple test to discover the heterozygous carriers. Dominant modes of inheritance might be more amenable to heredity counselling, since an affected individual could expect to transmit his defect to approximately half of his children. Dominant transmission of anomalies is, however, a relatively uncommon mechanism.

A joint committee of the National Academy of Sciences and the National Research Council has already reported upon their consideration of the danger to human heredity from exposure to radiant energy. They find that the average inhabitant of the United States receives background radiation to his gonads of about 4.5 roentgens during the 30 years of his reproductive life and about an equal amount from X-radiation for diagnostic or therapeutic purposes. An increase of this exposure to 30-80r is considered necessary before the present rate of genetic mutations would be doubled. The committee believes our most serious hazard to be from X-ray examinations, since prolonged fluoroscopy or multiple film examinations can subject an individual to 10, 20 or even 30r at one time. The risk from strontium-90 or fall-out from atomic weapons tests dwindles to insignificance compared to such figures. They recommend that our population should be protected by having cumulative records of roentgen exposures kept, and that minimum exposures be used. In the future it is possible that new techniques of examination such as the image-amplifier which by a television device permits low energy exposures, will supplant the

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present techniques. This committee emphasizes the importance of genetic transmission of anomalies by the undocumented statement that roughly half of all malformations are so determined.

Experimentally, malformations have been produced by subjecting pregnant animals to anoxia, to abdominal irradiation, to the influence of poisons such as selenium, hormones such as cortisone and insulin, antimetabolites, enzyme inhibitors and specific vitamin deficiencies. While it is possible that similar mechanisms operate in man, convincing evidence is lacking except for the effects of infection with rubella, exposure of the mother to X-rays, radium and atomic-bomb radiation, and hormonal influences accompanying maternal diabetes. More tenuous, but highly suggestive, is the role of anoxia, maternal illness, maternal age, and the effect of obstetric abnormalities such as early bleeding, placental insufficiency and retroversion of the uterus. In individual cases it is easy to make a retrospective judgment that one of these influences was responsible for a malformed infant. But prevention poses practical difficulties. In many instances the damaging influence operates before the pregnant woman comes under medical surveillance or even before she realizes she is pregnant. Some insurance can be offered prospective mothers through provision of good diets with adequate vitamin intake, by careful regulation of diabetes, by encouragement of child-bearing during the third decade of life, by avoidance of surgical procedures during early pregnancy and in particular by avoiding the use of anesthetics which produce hypoxia. The problem of protection against rubella during the critical weeks can be attacked in several ways. Females should be encouraged to court rubella before they enter the child-bearing years. Perhaps isolation of the virus will eventually make it possible to purposely transmit the disease to young girls, or will result in the preparation of an effective vaccine to immunize them in advance of pregnancy. At the present our best weapons after known exposure of a pregnant woman to rubella are the administration of gamma globulin or convalescent serum. Gamma globulin is readily available but its effectiveness is not proved. Convalescent serum has been used in Australia with an apparent reduction of the incidence of rubella to about 1/10 of that observed in the controls. The question of whether to abort women who suffer from rubella during the first trimester is a difficult one. Having seen normal infants result from such pregnancies, I do not believe that malformations are inevitable. At least one author places the risk to the infant as low as ten per cent. The issue is one which cannot be settled on a scientific basis alone. The role of other infections such as influenza, varicella and mumps is not nearly as definite as is that of rubella. Vaccination against influenza has not proved practical thus far. Varicella and mumps can, like rubella, be encouraged during childhood.

Processes which affect the fetus after it has passed the critical period of organ development are in general better understood. As a matter of fact, when a satisfying explanation is at hand for an aberration found at birth, it is likely to be removed from the category of congenital malformations. Examples are erythroblastosis, toxoplasmosis, congenital syphilis, cytomegalic inclusion disease, and the goitrogenic effects of antithyroid drugs given to the mother. We have learned how to prevent congenital syphilis, and have a highly satisfactory method of treating erythroblastosis. Perhaps in the future we can control some of the less common diseases of prenatal life. Chapple and others have directed attention to the effects of persistent fetal position and intrauterine pressures in the production of some of the less serious defects of the skeletal system such as positional deformities of the feet, metatarsus varus, asymmetry of the face, hypognathia, and bowed legs. Similarly, pressure phenomena are invoked to explain facial palsy, phrenic nerve paralysis, craniotabes and cephalhematoma. The relationship seems plausible, but we seldom have an explanation of why some babies alter their positions in utero and others do not. Occasionally uterine tumors, aberrations of placental implantation and paucity of amniotic fluid are thought to be factors in limiting the movement of the fetus. No good measures of prevention are known.

In closing I should like to offer the suggestion that a significant fraction of anomalies are due to chance miscalculation by the "organizers" which control the complicated assembly-line for the human infant. To any student of embryology, the production of a normal infant through 44 successive cell divisions of the ovum is a miracle of control and timing. The real mystery is not that we have malformed infants, but that the 5 per cent error in production is not much larger.

Medical History

Two Medical Men, a Pirate and a Soldier

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Thomas Dover (1660-1742)

The Pirate

Prosaically in successive editions of the British Pharmacopoeia is listed the preparation "Pulvis Ipecacuanhae Compositus" with a recommended dosage of 5 - 15 grains. This peculiar combination of an emetic with an opiate has long been used by physicians to combat pyrexias, and is widely known as Dover's Powders. Bottles of these tablets were present in every Regimental Dispensary in the last War. I have long thought that Doctor Dover was the prototype of Rafael Sabatini's "Captain Blood." Probably, he was, since the story of a physician turned pirate is unique, but there are certain chronological differences.

Thomas Dover (1660 - 1742) crammed into one lifetime the experiences of dozens of ordinary men. What is known about him makes it intolerable to consider what we do not know. He was born in Warwickshire about 1660. He is supposed to have taken his Bachelor of Arts degree at St. Mary's Hall, Oxford and his Bachelor of Medicine at Caius College, Cambridge. About this time he became a house pupil of Thomas Sydenham in Westminster. He was proud of this association with the great physician. In the "Ancient Physician's Legacy to his Country" first published in 1732 Dover speaks of 49 years of practice so he probably took his degree in 1683. His period with Sydenham must have been just before this.

While with Sydenham he recounts how he contracted smallpox. Dr. Sydenham's treatment consisted of blood letting: "In the beginning I lost twenty-two ounces of blood. He have me vomit but I find by experience purging much better. I went abroad, by his direction, till I was blind, and then took to my bed. I had no fire allowed in my room, my windows were constantly open, my bed clothes were ordered to be laid no higher than my waist. He made me take twelve bottles of small beer, acidulated with spirit of vitriol every twenty-four hours."

Dover began practice in Bristol in 1884 and it is recorded that he achieved considerable distinction as the first medical man to treat the indigent poor of the city without fee. In 1696 he was zealous in his efforts in combating an epidemic of spotted fever in the city. Here his great personal courage was displayed.

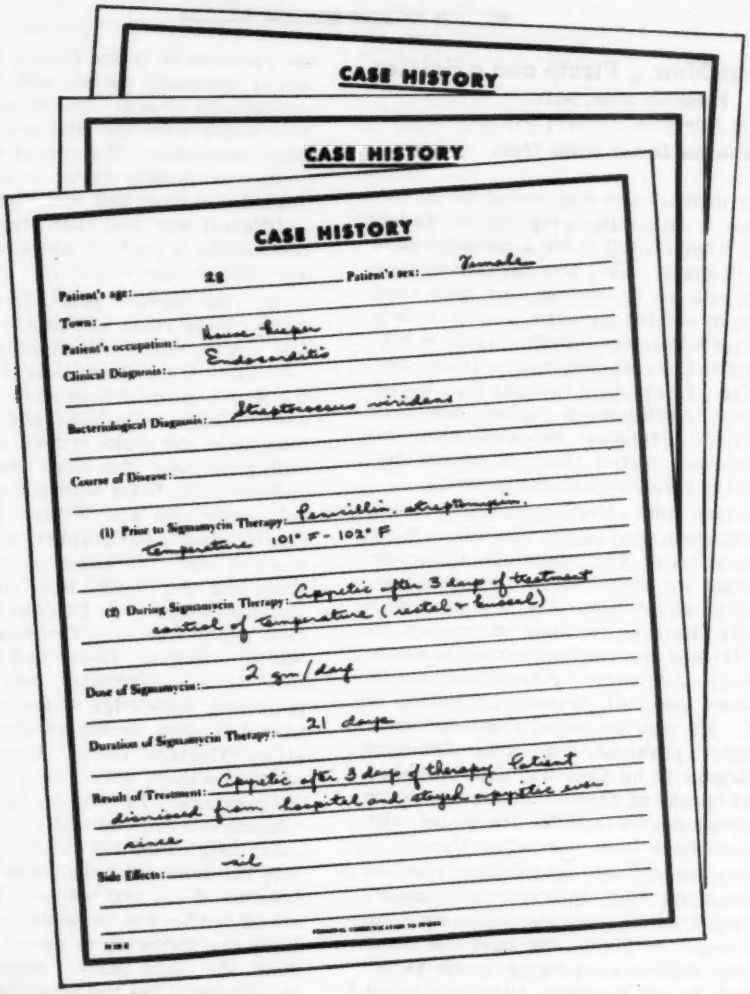
In those days there was a fine distinction between Privateers and Pirates. The Privateers sailed from England with the consent and, indeed, the approbation of the Crown to prey on the vessels of unfriendly nations with whom England was not actually at war. The Spanish colonies of the New World were the goal and also the victims of these marauders. The day of the Privateer, however, was coming to an end, but participating mightily in their end was Thomas Dover. What a different role had that other physician, David Livingstone, a century and a half later in the last days of the slave trade!

In 1708 Dover's practice, despite his philanthropic endeavours had prospered so well that he was able to invest substantially in a privateering expedition to the South Seas. He was associated in this with a group of Bristol merchants among whom were Alderman Bachelor and Sir John Hawkins. Two ships, the Duke and the Duchess were fitted with great care. The ships however were crowded and the holds filled with provisions. The pilot of this expedition was William Dampier, a famous seaman and hydrographer of the day, then 56 years of age. He knew more about the Spanish Main and the Pacific than any man then living. The commander was Captain Woodes Rogers who later wrote a book "A Cruising Voyage Round the World" about it. Dover had considerable investment in this expedition, and, though he had no particular knowledge of sea or ships, he was apparently made second or third in command and styled "Captain" Dover. Indeed he was president of the council and had a double vote in its deliberations. Dr. Phillip Gosse in an article in "Bookman's Journal and Print Collector" of February 1922 states that Dover's position in command was the decision of the partners of the expedition because of his vile temper. It was felt that this would render him so unpopular that he would not have any following to permit him to break away from the main party. Apparently, in many of these expeditions the subsidiary commanders were tempted to undertake independent sorties if not agreeing with the commander.

The expedition sailed from Kings Road, Bristol on 2nd of August, 1708 and after touching at Cork, steered for the Canary Islands. Rogers on the way was successful in suppressing a dangerous mutiny by whipping the ring leader. In this he was supported by his officers who were unusually numerous. Off Tenerife they captured a small Spanish barque laden with wine and brandy, which they added to their stores. They touched at St. Vincent of the Cape Verde Islands and Angra dos Reis on the coast of Brazil. They rounded Cape Horn in the beginning of January 1708-09, being driven by a violent storm as far south as 61° 53', which wrote Rogers "for aught we know is the furthest anyone has yet been to the southward." The men suffered severely from cold and wet.

*Read before the Medical Historical Society, Winnipeg, February 13th, 1957.

. . . Canadian doctors report . . .



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They attempted to reach the island of Juan Fernandez, located about 500 miles off the coast of Chile, sighting it on January 31st, 1709. Rogers later recounts how Dover went off in the pinnace, and at dark a light was noted by those on the main vessel which seemed to come from the shore. The pinnace returned after seeing the same light and being afraid that there was a Spanish garrison ashore. The next day Dover cautiously returned well armed and with seven men. They landed and there found Alexander Selkirk who had been left there four years and four months previously. He had been left there at his own request from a previous expedition commanded by Captain Dampier. The latter remembered him and vouched for his ability as a sea man. He was forthwith made mate on the Duke. Dampier's expedition had been unsuccessful and he had been unable to get a subsequent command.

Selkirk was rudely dressed in goat's skins. Rogers gives a vivid description of the former's stay on the island which is quoted by Osler in his biographical essay on Thomas Dover. It was this episode that Daniel Defoe used in writing his famous "Robinson Crusoe." Thomas Dover then was the rescuer of Robinson Crusoe. Again as with Rafael Sabatini, the fictitious character does not exactly follow his prototype. Robinson Crusoe was apparently wrecked on a Caribbean Island rather than the South Pacific. He was 28 years in exile instead of four. How poorer would we be without the romance of Robinson Crusoe! The rescue of Alexander Selkirk has put us all in the debt of the doughty buccaneer who later gave us "Pulvis Ipecacuhanae Compositus."

After refitting, the expedition cruised off the coast of Peru for some months, capturing several small vessels and one large one. They sacked and ransacked the town of Guayaquil, and Dover was active in the assault. The soldiers stored their plunder in the churches and spent the night there to guard it, but their sleep was much disturbed by the smell of recently buried corpses resulting from a plague epidemic. The next day they returned to their ships, but two days later nearly two hundred were ill with the plague. Dover ordered the ships surgeons to bleed each man to a hundred ounces and to give large draughts of dilute sulphuric acid. Apparently, as a result of or despite this therapy all but eight men recovered. What a chance was lost for a controlled series to test the therapy! They then sailed north and on December 21st, off the coast of California they captured a fine ship from Manila. Rogers was wounded in this encounter. They had a less successful engagement with another treasure ship later and sailed across the Pacific. They refitted and took fresh provisions at Guam and later at Batavia in June 1710. In October they sailed for the Cape of Good Hope which they reached on the 27th of December. Accompanying a Dutch convoy they reached England October 1st, 1711. Dr. Norman Moore in the Dictionary of National Biography recounts how Rogers' account of this voyage is superior to that of Cooke's who was first officer of the Duchess and afterwards Captain of the Marquis, one of the prizes. Dover had taken command of another which was named the "Bachelor," presumably after the Alderman, one of the partners in the expedition.

Captain Dover returned from the South Seas a wealthy man. It is recounted that the expedition realized the sum of 170,000 pounds and since he owned a considerable part of both ships he received a considerable share. Even Alexander Selkirk received 800 pounds. This successful voyage was subsequently quoted in support of other expeditions, and, probably, the establishment of the South Sea Company partly followed its success.

On his return Dover presumably resumed medical practice. It is possible that he spent some time in travel. In 1721 he was admitted Licentiate of the Royal College of Physicians. He states in his book "Ancient Physicians Legacy" that he lived in Gloucestershire from 1728 to 1729, but practiced at Cecil Street, London until then. In 1731 he lived on Lombard Street, seeing his patients at the Jerusalem Coffee House, Cecil Street on the Strand. In 1736 until his death he lived on Arundel Street, Strand.

Dover would have been about 70 years of age when he began his London practice. He employed the usual method of the day for self advertising by writing a book. This was published in 1732, entitled "An Ancient Physician's Legacy to his Country, being what he has collected himself in forty-nine years of practice." He also claims "that any person may know the nature of his own diseases together with the several remedies for each distemper faithfully set down." It was designed as a popular work, price stitched, five shillings.

This publication was avidly discussed in the coffee houses of the day. In it, Dover as well as attesting to his own efficiency in the practice of medicine espouses the therapeutic value of mercury to such an extent that he was called "The Quicksilver Doctor." The discussion and description of disease are not that to be expected of a pupil of Sydenham. In the section on gout is the formula for his famous powder, "Take Opium one ounce, Salt-Petre and Tartar vitriolated each four ounces, Ipecacuana one ounce. Put the Salt-Petre and Tartar in a red hot mortar, stirring them with a spoon until they have done flaming. Then powder them very fine; after that slice in your opium, grind them to a powder, and then mix the other powders with these. Dose from forty to sixty or seventy grains in a glass of white wine Posset going to bed, covering up warm and drinking a quart or three pints of the Posset—Drink while sweating."

In the book he struck harshly at the apothecaries who were the general practitioners of the day. They would refer their more serious cases to the

physicians but would benefit from the prescriptions ordered. Dover objected to the constant varying of prescriptions. He constantly deplored their excessive charges for medicines. Dover also feuded with the Royal College of Physicians.

Dover acquired a considerable reputation even on the continent, and Osler quotes a Genovese writer as extolling him as one of the most distinguished physicians of the time. The sixth edition of the Legacy was published in 1742 and he now speaks of 58 years of practice. He is supposed to have died in 1741 or 1742.

What incongruous epitaphs: on the one hand the prosaic "Pulvis Ipecacuhanae Compositus" in the British Pharmacopoeia and on the other the rollicking Captain Blood of Rafael Sabatini or the romance of Robinson Crusoe of Daniel Defoe. He lived life to the full and sucked deep on every spigot.

William Beaumont (1785-1853)

The Soldier

My next sketch concerns a different man. On one patient superbly studied rests his fame. A soldier surgeon he carried out his investigations in the United States Army. Osler calls him "a backwoods physiologist." William Beaumont came of Huguenot stock. His ancestors came from England to America in 1640. He himself was born in Lebanon, Connecticut on the 21st November, 1785. At twenty-one he travelled to Champlain, New York with "a horse and cutter, a barrel of cider and $100 of hard earned money." There, as school teacher he tended a store and studied medicine. He began two years apprenticeship with Dr. Benjamin Chandler of St. Albans, Vermont. Apparently the latter instilled in his pupil the habit of careful observation and record. On "the second Tuesday of June, A.D. 1812 "William Beaumont was licensed to practice by the "Third Medical Society of the State of Vermont." War with Britain being declared, he crossed Lake Champlain and presented his documents to the army. Duly brevetted surgeon's mate he was commissioned in December. His practice in the army was to keep two diaries, one of marches and engagements, and the other of medical problems.

First a march to Sackett's Harbour at the eastern end of Lake Ontario. A letter to his preceptor Dr. Chandler, is remarkable to those of us drilled in security during the last war, by its amount of information as to troop dispositions and intention. He describes in his diary the landing at York and of an engagement where the arsenal of the fort was exploded by the British with great loss of American lives. Then to Niagara and a hospital at Lewiston. In September 1814 he participated in the Battle of Plattsburg. There was a happy post victory dinner at the hotel there. With his resignation in late 1815 he went into private practice..

The Clinton County Medical Society was formed in October 1807, and Beaumont was admitted a member in 1819. Their original schedule of fees included items: "for each visit 25c, visit in the night 38c." The rate for an obstetrical case was $3.50. Here he met and became engaged to, his future wife. Here also practiced his cousin, Dr. Samuel Beaumont.

The Army attracted him back, and in 1820, commissioned post-surgeon, he was ordered to Fort Mackinac, arriving there in June. The Island of Mackinac, situated at the junction of Lake Huron and Lake Michigan, had had a long history, especially in connection with the fur trade. Marquette lies buried there, and La Salle had trod its shores. The American Fur Company had a post there and fur traders and voyageurs abounded. Deborah Beaumont became his wife, and they returned to his duties as fort surgeon.

On June 6, 1822 a shot gun was accidentally discharged and a young voyageur named Alexis St. Martin received a serious wound to his left chest and abdomen. Beaumont was called and arrived shortly. This was the opportunity and there was the man. The grievously wounded voyageur did not die and his wound left him with an opening into his stomach. Ten months later he was still helpless, but the unfeeling civil authorities contemplated sending the pauper 2000 miles home in an open boat. Beaumont on his $40.00 monthly salary cared for him in his own home. By June 1824 St. Martin was completely recovered, but the fistula remained.

The opportunity that this presented for physiological experiments into digestion soon occurred to Beaumont, and he began these at Mackinac. He was transferred to Fort Niagara in May 1825 and carried out a series of four experiments which he published. Still taking Alexis he went on furlough to Plattsburgh. There his subject abruptly left for home, in Canada, married, and subsequently had two children.

Postings followed to frontier forts, first Fort Howard on Green Bay in Michigan territory and later to Fort Crawford at Prairie du Chien. He carried on private practice as well. There were threats of floods and Indian wars The frontier was expanding and the Indians were resisting.

Fort Crawford was built on the Upper Mississippi and was subject to flooding, and, it was to have been abandoned. However, because of the impending outbreak of war with the Winnebago Indians this was deferred. There were mighty names in the fort and with them was William Beaumont. "Rough and Ready" Col. Zachary Taylor, Lieutenant Jefferson Davis among them. Here too was the dramatic surrender of the Winnebago chief Red Bird.

Through an agent of the American Fur Company Beaumont learned of St. Martin's whereabouts and after two years of negotiation and considerable

personal expense the former voyageur arrived with his family to act as Beaumont's servant and to participate in a second series of experiments in 1829. This monumental series was terminated two years later when Alexis had to return home for a period. He arranged to return for a projected visit to Europe. Plans for this visit were nearly completed in 1831, but had to be abandoned due to the potential outbreak of the "Black Hawk Indian War." This was followed by a cholera epidemic in the troops. Beaumont also had a large general practice in the town.

Finally Beaumont was granted a furlough in September 1832 and he went to Plattsburg, where St. Martin joined him. Time permitted only a period of study and experiment in Washington, where Alexis was made a sergeant in the detachment of orderlies stationed at the War Department. Prior to this the famous contract between the two men was drawn up:

" . . . the said Alexis will at all times during said term, when thereto directed or required by said William, submit to, assist and promote by all means in his power, such Physiological or Medical Experiments, as the said William shall direct or cause to be made on or in the stomach of him, the said Alexis, either through or by the means of, the aperture or opening thereto in the side of him, the said Alexis." Compensation was $150.00 for the year's service and "found."

Beaumont was planning the publication of his book and the Surgeon-General facilitated his work by transferring him to Plattsburg. Alexis had gone to Canada, but returned for the fourth series of experiments from July 9th to November 1st, 1833. There were also some exhibitions to medical meetings and then the subject returned home to visit his family. He was to return to Beaumont's new posting at St. Louis.

Publication of the book was rushed and it was registered that year as "Experiments and Observations on the Gastric Juice and the Physiology of Digestion" by William Beaumont, M.D., Surgeon in the United States Army.

Alexis did not return and although strenuous efforts were made he never again could be persuaded to enter Beaumont's service. The latter moved his family to St. Louis. Again he built up a busy practice in addition to his army duties. Surgeon-General Lovell who had been his friend and supporter for many years died in 1836 and Beaumont began to have increasing difficulties with his superiors. This ultimately resulted in his resignation January, 1840.

He continued his practice in St. Louis which became increasingly arduous. He was one of the early members of the Medical Society of Missouri. Even in 1846 in a letter to his cousin, Dr. Samuel Beaumont he still expressed hopes to persuade the evasive Alexis to come for another series of experiments. Some of his correspondence did not exhibit a very high opinion of his fellow practitioners. Indeed, some persons were very prone to belittle Beaumont's discoveries. In March 1853 he fell on some ice. A few weeks later he developed a carbuncle on his neck and died with an intractable fever on April 25th, 1853.

His famous patient apparently earned money by exhibitions and was even studied briefly by another physician. He was reported to have travelled to Europe at one time. During his life he received considerable chaffing about his fistula and was called "the man with a lid on his stomach." He died in poor circumstances at St. Thomas de Joliette, June 24th, 1870. Sir William Osler, who was in Montreal at that time went to great lengths to get an autopsy. The family however purposely let his body decompose before burial and then interred it eight feet below the ground.

The value of Beaumont's contribution to science was its straightforward recording of observed facts. He made basic observations and exploded then held opinions. Thirst for instance was not "an instinctive sentiment" but a sensation arising from the mouth and fauces due to dryness of those tissues. He showed that hunger was experienced in the stomach itself. Perhaps his greatest contribution was the demonstration of the amount of productive research possible without facilities by the employment of a facile mind. True he had a great opportunity which though unique could have happened to others. If it had been someone else, what then would have been the record of history?

Abstracts from the Literature

Bacterial Endocarditis Following Cardiac Surgery. Denton, C., Pappas, E. G., Uricchio, J. P., Goldberg, H., and Likoff, W. Circulation, Vol. 15: 525-531, April, 1957.

In the era prior to cardiac surgery bacterial endocarditis usually involved endocardial structures already damaged by rheumatic or congenital disease. The preponderant infecting organism was Streptococcus viridans, and it showed a tendency to seek out the aortic valve. Despite the disturbance to endocardial structures during cardiac surgery, the subsequent occurrence of bacterial endocarditis has not been frequently reported.

The authors comment on several reported series of cases of endocarditis following cardiac surgery, and summarize the occurrence of this complication in 2,263 patients undergoing surgery in a 5 year period. Of these, 1,889 were cases of valvular disease, and 374 of congenital heart disease. Twenty cases of bacterial endocarditis occurred, most frequently in patients having aortic valve disease. The most important infecting organism was a Staphylococcus, coagulase negative, and generally resistant to penicillin. Eight patients were successfully treated with various antibiotics. In 6 of the 12 fatalities treatment failed to arrest the infection.

It cannot be determined whether this represents a higher incidence of bacterial endocarditis than might have occurred without surgical intervention. The post-surgical variety seems to be a more malignant lesion, probably due to the extent of trauma, the nature of the organism, and the preceding stress of surgery.

V. M. Storrie, M.D.

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Factors Affecting the Mortality of Small-bowel Obstruction. C. Gale. M. J. Australia, 2: 669 (Nov.) 1956.

Operation, resuscitation, and intubation are the major factors affecting the mortality in small bowel obstruction. Operative procedures are basically no different than they were 25 years ago. Resuscitation, with proper fluid and electrolyte replacement, has advanced greatly. Laparotomy is undesirable without appropriate fluid and electrolyte replacement. Prolonged intubation is dangerous and even lethal without proper fluid and electrolytes. Intubation of the small bowel has many advantages over gastric and duodenal intubation. Continuous suction is superior to intermittent syringe suction. The advantage of continuous intestinal suction are more rapid and efficient decompression; a non-residue diet may be given orally once the tube has passed the duodeno-jejunal flexure; if operation is necessary, the bowel is in better condition and is amenable to even radical treatment; at surgery, palpitation of the tube may serve to identify the proximal bowel, in patients in whom this may be difficult. The author's modification of Wangensteen's suction apparatus is described and illustrated. Intestinal intubation is indicated in early post-operative obstruction, the obstruction of peritonitis, obstruction due to old adhesions, and in patients in whom operation is necessary, such as strangulating obstruction, for both pre- and post-operative measures. Four indications for surgery with prolonged intubation are evidence of possible strangulation, failure to obtain satisfactory decompression, inability to maintain nourishment, and failure of the obstruction to resolve.

The over all mortality rate in all cases of acute small bowel obstruction in the 5 years before July '55 was 9.5%.

Arnold G. Rogers.

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Diagnostic and Prognostic Significance of Serum Transaminase Levels in Coronary Occlusive Disease. Kattus, A. A., Watanabe, R. and Semenson, C. Circulation, Vol. 15: 502-511, April 1957.

This report presents the results of the serum glutamic oxalacetic transaminase (SGO-T) estimations performed in 255 patients suspected of having acute myocardial infarction.

In all but 1 of 11 cases of proven myocardial infarction the SGO-T was elevated, reaching a peak 24-48 hours after onset of pain, and gradually falling to normal after 3 or 4 days. The one exception was a patient who died 3½ hours following onset of symptoms. In 7 cases this elevation occurred before the electrocardiographic pattern was clearly diagnostic.

In 144 cases of probable myocardial infarction 63 patients showed SGO-T elevation of 44 to 800 units. Seven of these were proven infarctions at autopsy. In 71 patients the serial determinations showed no variation and were considered to have no myocardial necrosis, being classified as angina without infarction.

Fourteen cases of proven infarction sustained recurrent pain and this was accompanied by secondary rise and fall of SGO-T levels. Although the electrocardiogram showed no additional change, the SGO-T levels suggested extension of the previous infarction.

Experimental work in animals has indicated that the peak of SGO-T is proportional to the size of the myocardial infarct. Further autopsy studies are required to corroborate this theory in man. In this series there were 37 fatalities and the SGO-T tests in these patients suggest that levels above 350 units carry a grave prognosis.

The authors submit that this is of diagnostic value in cases where myocardial infarction is suspected but not proven by electrocardiographic and clinical findings. They stress the necessity for serial determination in order that the peak elevation not escape detection. False positive tests may occur if there is associated damage to skeletal muscle and other viscera.

V. M. Storrie, M.D.

Arterial Homografts for Peripheral Arteriosclerotic Occlusive Disease. Michael E. De Bakey, E. Stanley Crawford, Oscar Creech, Jr., and Denton A. Cooley. Circulation 15: 21-30, Jan. 1957.

Results are presented of 145 operations wherein lyophilized arterial homografts were used to improve blood flow in patients having arterial insufficiency of the lower limbs. In the past, sympathectomy and thrombo-endarterectomy have proven unsatisfactory in cases where circulation is impaired by occlusive disease of a main arterial channel.

In patients selected for operation, arteriography demonstrated occlusions below the aortic bifurcation, and a patent segment below and above the bifurcation of the popliteal artery. The presence of a good outflow in the peripheral arterial bed was an essential requirement. A high iliac obstruction was more likely to be a localized atherosclerotic process, whereas more peripheral lesions tended to be part of a diffuse process. The chief indication for operation was severe claudication, although some of the cases suffered painful ischaemic ulcers, rest pain, or gangrene of a limited degree. Where possible, the graft procedure was substituted for amputation where loss of a limb was probable.

In 30 extremities an occluded segment of less than 15 cms. was excised and replaced by the graft. In 115 cases a by-pass procedure was used, with an end-to-side anastomosis to the host artery above and below the site of occlusion. Successful restoration of blood flow resulted in 130 operations (90%). In those where grafts remained patent there was striking improvement in peripheral circulation, relief of claudication and rest pain, and healing of ulcers. Two patients had recurrence of symptoms due to thrombosis of the graft. In cases wherein the by-pass failed, the resulting circulation had not been made worse by the operation.

The end-to-side by-pass operation is judged an important factor in the success in this series, as it provides a large collateral vessel without jeopardizing the existing main or collateral channels. The technique is not complicated, requiring small incisions resulting in minimal tissue injury and early ambulation.

V. M. Storrie.

Course in Postgraduate Gastroenterology

The American College of Gastroenterology announces that its Annual Course in Postgraduate Gastroenterology will be given at The Somerset in Boston, Mass., on 24, 25, 26 October, 1957.

The Course will again be under the direction and co-chairmanship of Dr. Owen H. Wangensteen, Professor of Surgery of the University of Minnesota Medical School, who will serve as surgical co-ordinator and Dr. I. Snapper, Director of Medical Education, Beth-El Hospital, Brooklyn, N.Y., who will serve as medical co-ordinator. Drs. Wangensteen and Snapper will be assisted by a distinguished faculty selected from the medical schools in the Boston area.

The subject matter to be covered in the Course, from a medical as well as surgical viewpoint, will cover, essentially, the advances in diagnosis and treatment of gastrointestinal diseases and a comprehensive discussion of diseases of the mouth, esophagus, stomach, pancreas, spleen, liver and gallbladder, colon and rectum, with special studies of radiology and gastroscopy.

For further information and enrollment write to the American College of Gastroenterology, 33 West 60th Street, New York 23, N.Y.

Children's Hospital

Winnipeg, Man.

Re: Ward Rounds and Clinical Conferences

1. Weekly Grand Round 11 - 12 a.m. Thursday mornings throughout the year.

2. Medical Staff Clinical Luncheon, the first Friday of each month (except July and August), 12.30 to 2 p.m.

3. Special Tuesday noon conferences 12 to 1,
   First Tuesday of the month, Therapeutics, (Dr. Nickerson).
   Second Tuesday, X-ray Diagnosis, (Dr. Childe).
   Third Tuesday, Cardiac Conferences, (Drs. Ferguson, Medovy, Armstrong, etc.).

All these meetings take place in the Playroom at the East end of the first floor.

The members of the Medical profession are invited to attend these Conference and Ward Rounds.

Book Review

Function of Autonomic Transmitters. J. H. Burn, The Abraham Flexner Lectures, Williams and Wilkins, Baltimore.

This small volume is sharply subdivided into two sections: (1) chapters on "Medical Education and Medical Science" and on "Our National Drugs —Alcohol and Nicotine," and (2) five detailed chapters directly related to the title of the book. It is in the latter that Professor Burn is on home ground, and these chapters contain a wealth of thought provoking material. They are organized around studies conducted in the author's laboratories at Oxford, and are not intended to be comprehensive reviews. In each chapter the primary emphasis is on the development of a basic, and not infrequently unorthodox concept of physiological regulation or drug action. Experimental data, selected to illustrate and support the ideas being developed, are presented in some detail, and the vagaries of experimental methods are not neglected. However, the central theme is always the author's interpretation of the observations.

Few workers in the field will fail to disagree with some of Professor Burn's concepts, and some will disagree with many of them. I am sure that such reactions are anticipated by the author. However, disagreement on details will not cloud the importance of his forceful presentation of basic and often-forgotten points such as the probable nonmediator roles of acetylcholine and the multiple actions of drugs. Perhaps most important, between the lines of data and speculation the reader can obtain a clear picture of the scientific personality of one of the most stimulating of contemporary pharmacologists.

M. Nickerson.

♦

Ode to a Lady whose Uterus was Removed*

If your voice becomes mannish and husky,
Just think of our present Kay Starr,
As far as we can determine,
Her appeal is, A-1 by far ! ! !
If your mammary glands diminish and shrink,
And sweaters are just sweet dreams;
Remember the Big Stores carry
Foam rubber, by the reams.
They say that in the "Roaring Twenties"
Every Movie Star aspired to be "It,"
Clara Bow and numerous others,
Succeeded in becoming a Big Hit.
So cheer up my sweet little nothing,
We all think that you're really something.

*This poem was dashed off by one patient (Mrs. S. A.) to another patient (Mrs. M. J.).

A NEW CONCEPT

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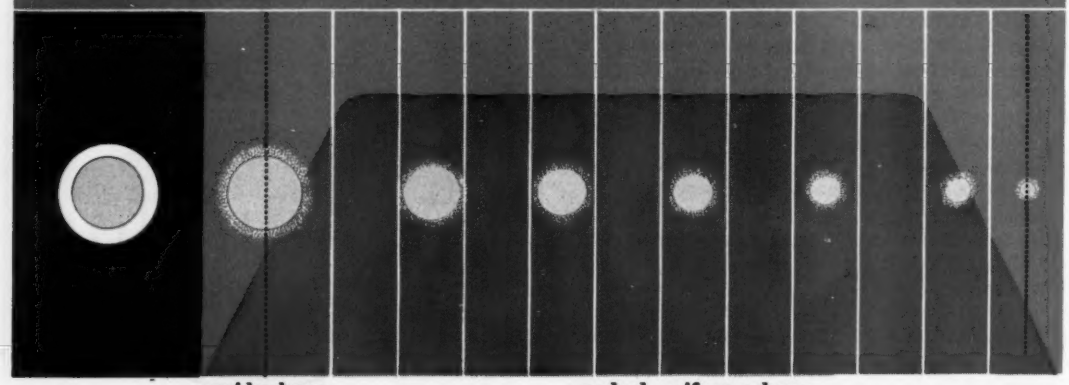

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MONTREAL

Editorial

S. Vaisrub, M.D., M.R.C.P. (Lond.), F.R.C.P. (C.), F.A.C.P., Editor

Pigeon-Holes and Pigeons

An amoeba which engulfs some particles of matter while rejecting others is a classifier. So is every other living organism which selectively accepts or refuses according to its needs. Man takes his first step in classification in the very act of perception, when he perceives an object not as a disjointed conglomeration of attributes, but an entity with many characteristics possessed by other objects — a member of a class. Mindful of his dignified status as Homo Sapiens, he then proceeds to assert his apardheit from the humble amoeba by constructing elaborate systems of classification, according to selected criteria.

The word "class" was introduced by Servitus Tullius in the Second Century A.D. to designate the six categories into which the Romans had been divided for purposes of taxation. The term has long since disassociated itself from taxes, even though it must be admitted that some classifications tax our memory and patience. It had since broadened to apply to any systematic arrangement into groups according to definite criteria. Classification has become the cornerstone of scientific methodology, and needless to say, an integral part of scientific medicine.

What constitutes a good medical classification? What are its ideal criteria? The interested reader will find an excellent analysis of the problem involved in the answering of these questions in the paper on "Classification of Epilepsy" by A. B. Houston, published elsewhere in this issue. In his article, Houston sets out several requirements for an optimum classification. Briefly stated, they are as follows: up-to-dateness, practical usefulness, adaptability to change, simplicity and precision of terminology, comprehensiveness and an approach stimulating critical appraisal.

Which of Dr. Houston's stipulations is the most important one? The answer can only be found in the reader's individual bias. It is "reader's choice." The practical reader will select the aspect of classification which emphasizes usefulness. Since his main concern, as a practicing physician, is the treatment of his patient, he will often prefer a classification with therapeutic implications to that with obscure and abstruse etiologic considerations. The pedantic perfectionist will choose the quality of comprehensiveness. Disregarding the disadvantages of cumbersome redundancy, he will insist on all-inclusiveness. The reader who happens to be preoccupied, as is the current fashion, with the problems of semantics, will undoubtedly select the requirement of precision and simplicity of terminology. He will submit that, if the main purpose of classification is the communication of organized information, it is essential that the terms used by the classifier convey to the reader the intended meaning without the risk of misunderstanding. The "progressive," scientifically-minded reader with an eye to the future will be attracted by the adaptability of the classification to change. He will appreciate the flexibility of the classification and its thought-provoking qualities. The historically minded, more interested in the past than in the future, will undoubtedly select the characteristic of up-to-dateness. He will submit that, since contemporaniety is an attribute possessed by many classifications, it renders the latter most serviceable to the study of medical history. He will note that the transitions from humoral medicine to that of "solid" pathology of organs (Morgagni) and subsequently that of tissues (Bichat) and cells (Virchow), as well as the current shift of emphasis to function and mechanism, have been duly reflected in the classifications of the corresponding period. The well-balanced, unbiased reader, with no axe to grind, will take equal pleasure in all the stipulations, maintaining that they all are essential prerequisites of an "ideal" classification.

There still remains, however, the reader who fails to be impressed by ideal classifications. He is the hardened sceptic, who would question the validity of the concept of ideal criteria. He is the stubborn cuss who would contend that if we do not subscribe to a metaphysical philosophy of Platonic vintage, we have no business to talk of ideal classes, for unless we believe, as did Plato, in the existence of real objects, the "ideas" which represent the "essence" of an object, and of which the individual object is but an imperfect copy, we cannot speak of "ideal" principles underlying classification. The pursuit of an ideal classification according to the sceptic, is the pursuit of a chimera.

An alternative view to the metaphysical, one which is more acceptable to the sceptical and critical mind, is the view which regards classes not as objective entities in the realm of the absolute, but as conceptual devices which help us to remember and to transmit to others certain information. In this view, classes are mere schematic abstractions, a kind of mental shorthand in the service of memory and communication. They are there not by dint of an independent existence, but by the grace of the classifier who compares objects and groups them according to criteria, which are entirely arbitrary.

Since criteria appear to be so much at the mercy of the nosologist, the latter emerges as a wielder of power and as such must be prepared to face the responsibilities of power and avoid its abuses. He must be on guard against pitfalls which may not

be too apparent on the surface. One of the pitfalls is extreme subjectivity on the part of the classifier, who selects criteria which are significant only to himself, but not to those for whom the classification is intended. This is to be avoided, for nosology is not meant to resemble surrealist painting, understood only by the artist, but incomprehensible to the viewer. Another pitfall is that of assumption of identity. It is all too easy to forget that objects in a class are not identical, that they resemble each other only within the limits of the stated criteria. This "differentness" of the members of the same class is lost sight of, often to the detriment of originality and creativity. The most important pitfall, perhaps, is the all-too-ready assumption that classification creates understanding of the objects that are classified. This is a delusion. Nosology aids memory, facilitates communication, and stimulates thought and imagination to further exploration, but it does not create fundamental knowledge. To quote Osler (Textbook of Medicine, 1895) "It is more important to understand the conditions in a given patient than to place his malady under a particular heading in a classification." The danger of the assumption of knowledge where it does not exist, lies in its stultifying effect on openmindedness and the spirit of scientific enquiry.

Aware of the limitations of classification, a good classifier will not arrogate to himself the role of a clarifier, but rather of an organizer, systematizer and transmitter of pre-existing knowledge. With understandable humility he will compare himself to a birdkeeper who knows that, while pigeons are living creatures of God, pigeonholes are but man made contraptions, intended solely for convenience.

The discerning reader, aware of the conceptual, selective, subjective nature of classification, will choose one that best suits his needs, and convenience. The choice is free, and the decision is his. It is his pigeon.

Ed.

Physicians' Art Salon

The Physicians' Art Salon Committee cordially invites Canadian physicians and medical undergraduates to enter the 1957 Salon to be held in the MacDonald Hotel, Edmonton, Alta., from June 17-21. This will be the 13th year that this popular art and photographic feature will take place at the annual C.M.A. Convention. It is again sponsored by Frank W. Horner Limited, Montreal, Que.

Conditions of Entry

Entries will be accepted in three sections:

1. Fine Art
2. Monochrome Photography
3. Colour Photography

The Fine Art section is further subdivided into three categories: Traditional, Contemporary (Modern), and Portrait. Classification into these categories is done by the judges. There is no restriction on media— oil, tempera, gouache, water colour, charcoal, pencil or dry brush is acceptable in each.

Each exhibitor may submit up to three entries in the Fine Art and Colour Photography and four in monochrome photography. Exhibitors may enter up to the limit in one or more sections. There is no charge. All costs, including transportation to and from Edmonton, will be borne by Horner.

Judging and Awards

All accepted entries will be displayed in the Salon and then judged for awards by a competent jury selected by the Art Salon Committee.

To obtain entry form

Any physician or medical undergraduate may obtain an entry form and complete details from the sponsor at P.O. Box 959, Montreal, Que. A short note or post card will bring the form along with complete instructions on how to prepare and ship your entries.

Art Salon Calendar

The Physicians' Art Salon Calendar, an attractive desk piece based on Salon exhibits will again be prepared by Frank W. Horner Limited. The Calendar reproduces selections from the award winners and is distributed to all physicians in Canada with the compliments of the Company.

Victorian Order of Nurses

1957 is Jubilee Year for the Victorian Order of Nurses. For sixty years the V.O.N. has been bringing nursing service to Canadians right in their own homes. Today as always, the V.O.N. nurse is "everyone's nurse."

The Winnipeg branch of the V.O.N. employs 19 staff nurses. Each nurse makes an average of seven (7) visits daily, always carrying out the orders of the attending psysician. Eight cars are owned by the V.O.N. and the area covered includes the following:

The cities of: Winnipeg, St. Boniface, St. James.

Municipalities of: St. Vital, Fort Garry, Tuxedo, Brooklands, East Kildonan, West Kildonan, North Kildonan, Old Kildonan, East St. Paul, West St. Paul, Charleswood.

Patients may be referred by the physician, or by hospitals, family or friends of the patient. In all instances instructions are obtained from the attending physician. Telephone 92-8529.

Association Page

Reported by M. T. Macfarland, M.D.

Professional Policy Committee

The committee, under the chairmanship of Dr. Hugh Malcolmson, has been holding regular meetings since mid-February. The members of the committee are as follows: Doctors F. G. Allison, W. J. Hart, S. Israels, M. K. Kiernan, D. N. C. McIntyre, W. G. Newman, Dwight Parkinson, M. J. Ranosky, O. A. Schmidt, and A. J. Winestock.

During this time the committee has been engaged in a study of the Report of the Special Commission of the M.M.A. which was published prior to the Annual Meeting in 1956. In addition, the development of a "Relative Value Fee Schedule" is under consideration .

At the March meeting of the M.M.A. Executive, the P.P.C. reported its recommendation that the M.M.S. fee for house calls should be equalized as between general practitioner and specialist, and further that the fee for such calls be raised to the specialists' rate as follows: Initial call $5.00; Subsequent call $5.00; Emergency, Sunday, Holiday and Night calls (6:00 p.m. to 8:00 a.m.) $6.00. This was accepted by the Executive.

The P.P.C. has also requested clarification of its terms of reference. This was brought up at Executive meetings both in March and April. As one example, it was mentioned that the radiologists and pathologists wish to alter their present relationships with the hospitals. (This was reported on the Association Pages in April and May numbers of the Review). Since this might ultimately affect the Manitoba Medical Service, the committee wished to know exactly its responsibilities in such a matter. Another example is the problem of implementing the recommendations concerning payment of fees by the M.M.S. to assistants at surgical operations. At the time of writing, this has not been settled, and the P.P.C. does not yet feel confident as to its exact duty in the matter.

Part of the difficulty stems from the manner of discussion of the Report of the Special Commission at the Annual Meeting of M.M.A. in October 1956. The report was discussed in detail, but with the meeting sitting in Committee of the Whole. This device was used to allow fuller and freer discussion. It appears that, while the opinion of the meeting was adequately expressed, the Report was not actually adopted by the meeting, since the Committee of the Whole has not the power to do so. Thus the Report of the Special Commission is referred back to the Executive, and through it to the Professional Policy Committee for further consideration and for implementation by the Executive. However, at the April meeting of the Executive, the following motion was passed "That the assistant's fee be assigned from general funds (i.e. not from the fee of the surgeon) of M.M.S. at rates to be decided by the Professional Policy Committee.

Committee on Economics

The report of this committee to the Executive at its April meeting contained two matters of some interest. The matter of the Relative Value Fee Schedule was mentioned. It is considered that this might at least be worked out on a national scale, rather than by the individual divisions. The bureau of economic research was thought to be the best agency to undertake the study. However, since this will be time-consuming, a special committee of the C.M.A. or one of the provincial divisions may be asked to undertake it, with the necessary assistance to be provided by C.M.A.

The chairman of the Economics Committee, along with the officers of M.M.A. met with the Hon. R. W. Bend, Minister of Health, and Dr. Morley Elliott, Deputy Minister of Health, late in March of this year. The purpose of the meeting was to present to Mr. Bend the recommendation of the Executive to study and recommend concerning matters pertaining to hospital, medical and diagnostic services. Mr. Bend appeared to favor the suggestion. At the time of writing, it is not possible to report what action is to be taken.

1957 Legislation of Interest to the Medical Profession

Bill 8—An act to amend The Chiropodists Act —This amendment restricts the use of the word "Doctor" or the abbreviation "Dr." by chiropodists.

Bill 9—An Act to amend The Health and Public Welfare Act—Two Acts passed in 1956, The Alcoholism Foundation Act and The Elderly Persons Housing Act are added to the list of Acts administered by the Department of Health and Public Welfare.

Bill 13—An Act to incorporate The Dietetic Association of Manitoba.

Bill 23—An Act to validate By-law No. 749 of the Rural Municipality of Harrison.

Bill 34—An Act to amend The Vital Statistics Act—The time within which registration of births, marriages and deaths must be made is changed from 90 days to one year.

Bill 46—An Act to amend The Licensed Practical Nurses Act—This amendment gives the council power to prescribe examination fees by regulations approved by the Lieutenant-Governor-in-Council.

Bill 55—An Act to amend The Cemeteries Act —The addition of two new Parts dealing with crematories and with the investment of perpetual care funds.

Bill 68—An Act to amend An Act to incorporate "The Manitoba Institute for the Advancement of Medical Education and Research" — Change of name to "Winnipeg Clinic Research Institute."

Bill 70 — An Act to incorporate "Victoria General Hospital."

Bill 73 — An Act respecting the Practice of Physiotherapy — Physiotherapy defined, and a "registered physiotherapist" is a person registered under the Act who practices physiotherapy only under the direction of a legally qualified medical practitioner, does not diagnose or prescribe and whose education and qualifications meet the standards required by this Act.

Bill 75—An Act to regulate the Practice of Optometry — Request for wider definition of Optometry and use of the prefix or title "Doctor" or the abbreviation "Dr." amended before passage of the Bill.

Bill 79—An Act to provide for the establishment of a Cancer Treatment and Research Foundation —a new Act to replace the Cancer Relief Act— Members will no longer be named to the Board by the Manitoba Medical Association, College of Physicians and Surgeons or the Board of Governors of the University of Manitoba but all three bodies will submit nominations for appointment to a Medical Advisory Board.

Bill 92—An Act to amend The Health Services Act — The amendment makes it unnecessary to register the regulations under The Regulations Act, but they would still have to be published in the Gazette. Provision is made for a laboratory and x-ray unit to charge a hospital in accordance with the regulations. This new section would permit boards of hospital districts to allow unused hospitals to be used for other purposes.

Bill 98—An Act for granting to Her Majesty Certain Sums of Money for the Public Service of the Province for the fiscal year ending the 31st day of March, 1958.

VIII. Health and Public Welfare

1. Executive Division	$ 374,915.00
2. Health Division	8,749,421.00
3. Welfare Division	5,532,526.00
4. Building and Other Projects— Chargeable to Capital Division	59,000.00
5. Construction Grants	610,000.00
	$15,325,862.00

Bill 99—An Act to amend The Public Health Act—The present section 39 requires that the person wishing to be exempt from inoculation must make the statement. The amendment would allow a parent to make the statement on behalf of his child.

Bill 100—An Act to provide for the Granting of Aid to Municipalities for Social Assistance—Social Assistance defined as (i) maintenance provided by a municipality under The Child Welfare Act through the agency of a children's aid society or the Director of Public Welfare; or (ii) direct aid to an indigent person by way of (a) food, (b) clothing, (c) shelter, fuel, light or water, (d) medical, dental and optical care, or any of them, including prescriptions and supplies for any of those purposes; (iii) the burial of an indigent person by or at the expense of a municipality; (iv) other expenditures for the relief of indigent persons approved by the minister in accordance with the regulations. The cost of the social assistance provided by a municipality does not include the cost of (a) administration by the municipality; (b) hospitalization; (c) grants to hospitals or social agencies, or both; (d) the operation, whether incurred for capital outlay or current expenditures, of (i) medical care districts, or (ii) local health units, or (iii) diagnostic units, or (iv) hospital districts or medical nursing unit districts, or (v) institutions owned or operated, or both owned and operated, by a municipality or jointly by two or more municipalities.

Bill 103—An Act to amend The Hospital Aid Act—The new section 21B (1) provides: "Where on or after the first day of April, 1957, the person, firm or corporation responsible for payment of the whole or any part of the hospital account of a patient, who is under hospital care and treatment otherwise than as an out-patient, requests the minister to issue a certificate under this subsection and satisfies the minister that the patient has been under hospital care and treatment, otherwise than as an out-patient, for a total of one hundred and eighty days during the twelve months previous to the day the request is made; the minister may issue a certificate to the Provincial Treasurer . . . for the payment of the hospital account."

Section 11 of the Act relating to Section 24: "Section 24 provides that the government shall pay the hospital accounts of certain indigent patients. The amendment makes it clear that the government shall pay only at the rates established by The Hospital Rate Board or the usual standard ward rates."

Bill 110—An Act to amend The Highway Traffic Act—7. "Subsection (15) of section 18 permits the registrar to require persons applying for an instruction permit or a licence to produce a certificate from the provincial psychiatrist. The amendment would permit such a certificate to be obtained from a person qualified as mentioned in the amendment." (A duly qualified medical practitioner who is a psychiatrist as defined under the Medical Deficiency Act.)

Your Guide to Better Press Relations

One of the major PR ills afflicting the medical profession is press relations. Why? Fundamentally it is due to fear and misunderstanding resulting in distrust.

Many doctors, when approached by newsmen, fear sensationalism, distortion, gross error, criticism by colleagues. The media accuse doctors of obstructionism and uncooperativeness.

There is no one simple answer to this problem. In many cases understanding and trust have grown from frequent contact between doctor and newsman. Group meetings of doctors and representatives of the news media have sometimes helped to improve medical-press relations.

Acutely aware that these two approaches to better PR left too much to chance, the Canadian Medical Association began working four years ago on a Code of Cooperation for doctors and newsmen, medical societies and news media. That project has been completed. On June 1 copies were sent to each member of the Association with his issue of the Canadian Medical Association Journal. About the same date copies were sent to every managing editor of Canadian newspapers and to the managers of radio and television stations.

But distribution alone is not sufficient to make the Code a success. This can only be accomplished through active application of the Code's principles by every doctor in his day-to-day activities. By the same token, newsmen and the media they represent, must abide by the philosophies expressed in the Code and attempt to understand the doctor's point of view and the ethical and legal restrictions placed upon him.

Only by this dual acceptance and application can the Code be truly a cooperative guide.

Organized medicine can do much to stimulate use of the Code. Branch societies should call attention to the document and urge each member to read it and apply it in his relations with local press, radio and TV. Local meetings between doctors and news media representatives should be organized to discuss the Code and its implications. These gatherings have the added advantage of bringing doctors and newsmen together out of which contact, as has been said, understanding and confidence frequently develops.

Obviously a document of this type is not going to receive the approbation of every member of the medical profession nor of all news media. However, during the four years of development of the Code, every effort was made to obtain the opinions of as many doctors and newsmen as was physically possible. Each successive draft of the Code was reviewed by the Committees on Public Relations of the Divisions and subsequently by representatives of the media. The finished product, therefore, reflects the composite opinions of profession and the news media.

The Code of Cooperation is not a static document. After it has been in use for a period of time it will be reviewed to correct its inadequacies. These will only come to light if the constructive criticisms and recommendations of both doctors and newsmen are received.

In summary, it is strongly recommended that doctors:

(1) Read and study the Code of Cooperation.

(2) Use the Code as a guide in his relations with the news media.

(3) Discuss the Code with newsmen.

(4) Recommend through Divisional PR Committees ways in which the Code may be improved.

The units of organized medicine should:

(1) Exhort their members to read and use the Code.

(2) Arrange for discussions with news media.

(3) Implement those parts of the Code which are directed at medical societies.

Professional Advertising

The Executive Committee of the College of Physicians and Surgeons has recently found it necessary to communicate with members of the profession who have been in the habit of carrying professional cards in local newspapers.

The attention of all is directed to that portion of the Code of Ethics of the Canadian Medical Association which reads as follows:

"The word 'Advertising' in relation to the medical profession must be taken in its broadest sense. It includes all those methods by which a practising physician is made known to the public, either by himself or by others without his objection, in a manner which can be fairly regarded as having for its purpose the obtaining of patients or the promotion in other ways of the physician's individual professional advantage.

"Excepting a plain card which conforms to local usages, any form of advertising is unprofessional for the practising physician. Practice should not be gathered by any kind of solicitation, direct or indirect. The best advertisement of a physician is a well-merited reputation for ability and probity in his profession.

"'Advertising may be very insidious. A physician should not procure, sanction, be associated with or acquiesce in, notices which commend his own or any physician's skill, knowledge, services and qualifications, or which deprecate those of others.

"An honourable physician will never be guilty either of boasting of cures, or of promising radical cures, or of self-praise in order to gather practice."

Members are requested to reconsider their position in the light of comparative freedom from professional cards in the larger daily newspapers of the metropolitan area.

Announcing a unique new rauwolfia derivative . . .

First report on one of the most encouraging advances in psychopharmacology since the introduction of rauwolfia: a tranquilizing-antihypertensive agent which combines the potency of the rauwolfias with significantly fewer and milder side effects.

In mid-1955, Abbott Laboratories released for clinical trial a new alkaloid of *Rauwolfia canescens*. This new alkaloid, later named Harmonyl, received special attention because of the high potency and low toxicity it exhibited in pharmacological testing.

Since that time, Harmonyl has been tried in conditions ranging from mild anxiety to major mental illnesses and in hypertension. Every characteristic of the drug was studied . . . evaluated . . . compared. And from the reports, one fact stands out:

- In more than two years of clinical evaluation, Harmonyl has exhibited significantly fewer and milder side effects in comparative studies with reserpine. This, while demonstrating effectiveness comparable to the most potent forms of rauwolfia.

- Most significant: Harmonyl causes less mental and physical depression. *And there are very few reports of the lethargy seen with many other rauwolfia preparations.*

This is not to suggest, of course, that side effects will not occur with Harmonyl—as with any potent therapeutic agent. But the mildness of side effects, in the few instances in which they have been reported, suggests Harmonyl as a drug of choice in conditions ranging from mild anxiety to major mental illness and in hypertension.

Why fewer and less severe side effects?

Some investigators suggest that the evidence of less parasympathetic effect with Harmonyl in animals might also be true in man. In chronic toxicity studies with Harmonyl this was manifested by less diarrhea, "bloody tears" and ptosis in rats than was observed with the same dosage level of reserpine. Dogs also exhibited milder side effects — in particular, diarrhea. No organ toxicity or hematological change occurred over a wide dosage range.

Harmonyl as a tranquilizer

While Harmonyl's safety is most impressive, clinical investigators have reported other notable characteristics for this wide-range tranquilizer. For instance, following an eight-month study of chronic, hospitalized mental patients, Ferguson[1] reported:

Social News

Reported by K. Borthwick-Leslie, M.D.

Whew! and Wow! What a month May, may be! Final examinations, followed by that horrible state of suspended animation, leading up to Convocation, or Despair.

Convocation, with all its fanfare, excitement and parents bursting with pride, while tenderly squirming about on calloused posteriors. Oh for softer benches.

Bigger and better parties, hectic polishing of personal effects, packing—Bye, Mom—Here endeth the student's era, and beginneth the serious future.

Congratulations to all the Grads in Medicine and welcome to that certified state of "Doctor of Medicine."

Heaven help you, in your chosen profession and further studies, such as:

Dr. A. Zipursky, has been granted a Fellowship by the Canadian Life Insurance Fellowship Fund to continue research on erythrocyte phosphorus metabolism in normal people and those with acquired hemolytic anemia.

Dr. John Colwell, U. of M. '50 has been awarded the John S. McEachern Memorial Fellowship for training in Washington University, St. Louis, under the auspices of the Canadian Cancer Society. Lung Cancer is to be his special program.

♦

John F. Hughes, M.D., M.Sc., (Med), F.R.C.P. (C) announces the opening of his office, 326 Medical Arts Bldg., Winnipeg, for the practice of Internal Medicine.

♦

Dr. Walter Colert, Morden, Man., has asked me to announce that the Manitoba Water Ski Championship will be held on Lake Minnewastu, Morden, on Sunday, August 18th, starting at 9 a.m.

You are all invited to attend and are promised a jolly good show. At least five clubs will be competing and many other attractions will be on hand.

That's a mighty beautiful lake and summer resort in my old home town.

♦

Dr. J. C. MacMaster, Executive Director of our M.M.S. is speaking in Toronto at the Canadian Public Health Association meeting. His topic "Provision of Preventative Services under a Prepaid Medical Plan," stressing the care of children under 16 years.

Dr. MacMaster was invited particularly because of his vast experience with the wide range of medical benefits in Manitoba as compared to the other provincial plans.

♦

Dr. and Mrs. Gerald H. Holman and small Kelvin are visiting their parents in Winnipeg. Dr. Holman is doing postgraduate work in Baltimore, at Johns Hopkins.

Dr. and Mrs. Gordon Woodall and small son Christopher, arrived from Vancouver to attend Dr. Woodall's graduation exercises. Dr. and Mrs. Woodall will return to B.C. shortly.

♦

St. Luke's Anglican Church, May 25, was the site of marriage of Joan Laura Sinclair and Dr. James Warren.

The bride is a '56 graduate of Grace Hospital School of Nursing and the groom a '57 graduate in Medicine, U. of Manitoba.

Following a reception at the Fort Garry Hotel, Dr. and Mrs. Warren left for Vancouver where they will reside.

♦

Dr. and Mrs. Kenneth Davidson, Vancouver are renewing old friendships in Winnipeg.

They are guests at the Fort Garry Hotel this week.

♦

Dr. and Mrs. A. T. Mathers announce the engagement of their only daughter, Mary Gretchen, to Mr. Wm. George Shelton, Kirkfield Park. The wedding will take place June 15, 1957.

♦

Mr. and Mrs. W. Papageorgiou announce the engagement of their daughter Dr. Doreen Olive to Dr. Yves Noel Joubert, son of Mr. and Mrs. Joubert, St. Pierre, Man. The marriage will take place June 22, 1957 in St. Ignatius Church.

♦

Dr. and Mrs. A. Bourgeois welcome baby Roselle Emily, April 20, 1957.

♦

Dr. and Mrs. Oosterhuis (nee Donalda Borthistle, R.N.) announce the arrival of David Richard on May 26, 1957.

♦

Dr. and Mrs. Sam Kobrinsky announce the birth of their daughter, May 21, 1957.

♦

Dr. and Mrs. W. E. Pace (nee Betty Waugh) announce the arrival of Mary Catherine in London, Ont., May 16, 1957, baby sister for Ann, John and Ron.

♦

Mr. and Mrs. John H. Restall (nee Dr. Bernadine Roe) proudly report the arrival of Sidney Roe, May 19, 1957. Another good Anaesthesiologist gone wrong! Congratulations, Bernadine.

♦

Remember
August 18, 1957, 9 a.m.
Morden, Man.
Lake Minnewastu — Colert Beach
Manitoba Water Ski Championship

Department of Health and Public Welfare

Comparisons Communicable Diseases — Manitoba (Whites and Indians)

DISEASES	1957 March 25 to April 20,'57	1957 Feb. 24 to March 23,'57	1956 March 25 to April 21,'56	1956 Feb. 26 to March 24,'56	Total Jan. 1 to April 20,'57	Total Jan. 1 to April 21,'56
Anterior Poliomyelitis	2		1	2	4	4
Chickenpox	99	123	58	86	443	354
Diphtheria		9			17	
Diarrhoea and Enteritis, under 1 year	27	17	7	9	63	35
Diphtheria Carriers	....	4	....	....	9	....
Dysentery—Amoebic	....	....	....	....	....	....
Dysentery—Bacillary	2	....	....	1	2	5
Erysipelas	....	3	2	2	4	8
Encephalitis	....	....	....	....	....	....
Influenza	8	31	4	9	42	32
Measles	366	519	105	210	1676	609
Measles—German	8	22	35	31	62	107
Meningococcal Meningitis	2	....	....	....	3	2
Mumps	95	113	189	196	336	668
Ophthalmia Neonatorum	....	....	....	....	....	....
Pneumonia, Lobar	....	....	....	....	....	
Puerperal Fever	....	....	....	....	....	1
Scarlet Fever	6	12	5	21	55	62
Septic Sore Throat	5	....	....	....	6	4
Smallpox	....	....	....	....		....
Tetanus	....	....	....	....	1	....
Trachoma						
Tuberculosis	31	41	35	45	121	119
Typhoid Fever	....	....	....	....	1	....
Typhoid Paratyphoid	....	....	....	....		1
Typhoid Carriers	....	1	....	....	1	....
Undulant Fever			2	1		4
Whooping Cough	11	20	34	28	78	107
Gonorrhoea	81	77	103	123	283	431
Syphilis	8	7	5	8	30	23
Jaundice, Infectious	52	117	57	25	233	127

Four-Week Period March 24 to April 30, 1957

DISEASES (White Cases Only) *Approximate population	*850,000 Manitoba	*880,665 Saskatchewan	*5,404,933 Ontario	*2,362,000 Minnesota
Poliomyelitis	2	—	—	—
Chickenpox	99	21	2483	†
Diarrhoea and Enteritis under 1 yr.	27	—	†	†
Diphtheria	—	—	1	1
Diphtheria Carriers	—	—	—	—
Dysentery—Amoebic	—	—	—	—
Dysentery—Bacillary	2	5	5	2
Encephalitis Epidemica	—	1	2	—
Erysipelas	—	3	3	†
Influenza	8	†	9	1
Jaundice, Infectious	52	44	62	29
Measles	366	20	1564	2683
German Measles	8	15	272	†
Meningitis Meningococcal	2	—	6	1
Mumps	95	18	1241	†
Psittacosis	—	—	—	2
Pertussis	—	—	—	—
Puerperal Fever	—	—	—	†
Scarlet Fever	6	7	354	77
Septic Sore Throat	5	45	1	63
Smallpox	—	—	—	—
Tetanus	—	—	—	—
Trachoma	—	—	—	—
Tuberculosis	31	35	106	95
Typhoid Fever	—	—	2	—
Typh. Para-Typhoid	—	2	—	—
Typhoid Carrier	—	—	—	—
Undulant Fever	—	—	3	—
Whooping Cough	11	—	81	3
Gonorrhea	81	†	121	†
Syphilis	8	†	19	†

†These figures were not given on their reports.

DEATHS FROM REPORTABLE DISEASES

April, 1957

Urban—Cancer, 79; Measles, 1; Pneumonia, Lobar (490), 4; Pneumonia (other forms), 29; Septicaemia and Pyaemia, 1; Syphilis, 1; Tuberculosis 3; Gas Gangrene, 1. Other deaths under 1 year, 24. Other deaths over 1 year, 284. Stillbirths, 15. Total, 442.

Rural—Cancer, 24; Diarrhoea and Enteritis, 4; Influenza, 3; Jaundice (infectious), 1; Measles, 1; Pneumonia, Lobar (490), 3; Pneumonia (other forms), 6; Tuberculosis, 5; Chickenpox, 1. Other deaths under 1 year, 19. Other deaths over 1 year, 200. Stillbirths 14. Total, 281.

Indians — Diarrhoea and Enteritis, 1; Pneumonia (other forms), 4. Other deaths under 1 year, 1. Other deaths over 1 year, 2. Stillbirths, 3. Total, 11.

♦

Poliomyelitis — Two cases have occurred, both showing slight paralysis but are steadily improving.

Diarrhoea and Enteritis Under 1 Year—It will be noted the number of cases are almost double that of the same period last year. Perhaps it would be well to be on the lookout for this disease in infants.

Measles—Not as many reported as in the previous four week period and it is hoped that with summer coming on the number will still be much less.

Detailmen's Directory

Representing Review Advertisers in this issue, whose names are not listed under a business address.

Abbott Laboratories
G. J. Bowen 4-4559
R. G. (Bud) Harman 50-7509
Alan (Al) M. Grant 23-1802
Bruce Hunter 42-5263

Allen and Hanburys Co. Ltd.
H. W. (Bert) Heaslip 6-4596

Ayerst, McKenna and Harrison
W. R. Card 40-7115
C. G. Savage ..... SU 3-4558
Jack Ostrow ..... ED 4-3240

Bencard, C.L.
W. J. Tarbet 93-6451

Borden Company Ltd.
Ken Hodges 59-6361

British Drug Houses
F. J. Burke ..... SP 4-3816
Gerald Reider ..... SP 5-2061
W. S. Langdon 43-1325
H. Harvey 6-5341

Calmic Limited
Ken Harrison ..... VE 2-4120

Carnation Company Ltd.
Dan Wright ..... ED 1-3515
Den Bryant 6-2068
Tod Thurston ..... SU 3-9370

Ciba Company Ltd.
Leslie D. MacLean 23-3240
P. Brendan Murphy ..... SU 3-9933

Connaught Laboratories
Brathwaites Ltd. 92-2635

Frosst, Chas. E.
W. M. Lougheed 40-3963
W. J. McGurran 20-8231
E. R. Mitchell 40-6164
R. P. Roberts 23-5900

General Electric Co. X-Ray Dept.
E. A. Nickerson 92-4277

Horner, Frank W. Limited
Jos. Lavitt 59-1691
Don Harrison 4-6864
Frank Lowe 2-5821

Lederle Laboratories
J. G. Jonasson ..... SP 5-4862
W. C. Hall
J. E. Smith 20-4727

Merck Sharp and Dohme (Canada) Ltd.
W. G. Ball 4-5702
Noel J. Pritchard 40-1162
E. J. Strimbicki ..... SP 4-0302

Nadeau Laboratory Ltd.
Andrew Desender 20-4909

Ortho Pharmaceutical Corp.
Don MacDonald 4-6438

Parke, Davis & Co.
L. W. Curry 40-1138
B. S. Fleury 40-4441
R. J. Robinson (Brandon) 92-288
J. A. Winram 40-5372

Pfizer Canada
E. E. Conway 6-6002
W. R. Mitchell ..... SP 2-0676
W. G. Johnston 6-1391

Poulenc Limited
W. J. Plumpton 4-5561

Riker Pharmaceutical Co. Ltd.
John R. Falconer 4-5852

Robins (Canada) Ltd., A. H.
Harold Tetlock 50-8386

Sandoz Pharmaceuticals Ltd.
H. D. Robins 6-2825

Schmid (Canada) Ltd., Julius
Wm. D. Guy 40-2481

Searle & Co., G. D.
Harry Chambers 50-6558

Squibb & Son, E. R.
J. H. Don MacArthur 40-4741
M. G. Waddell 4-1552

Warner-Chilcott Labs.
A. L. (Andy) Argue 6-1619
John E. Lee 43-2062

Will, Chas. R.
A. C. Payne ..... VE 2-2055

Winthrop Laboratories
R. M. Kelly 40-6459

Wyeth & Bro., John
A. W. Cumming 40-5694
Stuart Holmes 59-4273

Internship in Pathology

Approved Senior Internship in Pathology in large Veterans Hospital, available January 1st, 1958, for six months. Salary $175.00 per month. Curriculum vitae and photograph required. Reply to: Dr. C. N. Crowson, Director of Laboratories, Deer Lodge Hospital, Winnipeg 12, Manitoba.

Office For Rent

Furnished 4 room doctor's office in residential North Winnipeg, Burrows Ave., one block west of Main. Well established for thirty-one years, up to present day. Excellent opportunity. Present occupant moving out June 1st. Apply—Mrs. I. Pearlman-Litvack, 291 Burrows Ave., Winnipeg 4, Man. Phone 59-5486.